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ABSTRACT

This investigation was designed to explore the differences between 6th grade underachievers, average achievers, and overachievers in reading in their later achievement and behavior and to compare relationships to reading achievement that occur for students with high socio-economic status (SES) background and low SES background, and students with high IQ scores and low IQ scores. The purpose of dividing the sample into subgroups based on the major variables of IQ, SES, race and sex was to determine whether the effects of underachievement in reading were modified in groups differing in these characteristics. Differences that were found were small and generally overshadowed by the consistent pattern reflected in all groups: i.e., underachievers in the 6th grade performed at a lower level than average achievers on standardized tests, course marks, and other measures of achievement all through secondary school. Included is the supplement to Part Two and Part Three. See Part One [ED 034 660], and Part Three [CS 000 079]. (Author/WR)

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Reading Achievement and Its Relationship to Academic Performance

Part II:

Relationships of Reading Achievement in Race, Sex, Socio-economic, and Mental Ability Groups

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Laboratory Paper #28
Personal and Social Organization Section
Mental Health Study Center
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Relationships of Reading Achievement in Race, Sex, Socio-economic, and Mental Ability Groups

Dee Norman Lloyd[1]

Many studies have established that mental ability, as measured by group or individual intelligence tests, is positively related to achievement. Also, in studies where socio-economic status (SES) has been related to general achievement and in studies where groups of underachievers and average achievers have been compared, relationships between educational and occupational background of students and achievement level have been found (Frankel, 1960; Lavin, 1965; Newton, 1959; Engle, 1967; and Chopra, 1967). The majority of studies on underachievers in the literature have used only subjects in the above-average mental ability range. The most common approach has also been to control differences in IQ or SES level by matching subjects on one or the other of these variables. The present investigation was designed to explore the differences between 6th grade underachievers, average achievers, and overachievers in reading in their later achievement and behavior and to compare relationships to reading achievement that occur for (1) students with high SES background and low SES background, and (2) students with high IQ scores and low IQ scores. Comparison of achievement groups within the different strata of SES and IQ was directed at determining whether problems of underachievers in these groups differ, and whether the general detrimental effect of underachievement in reading on later academic performance that was found in the total sample (Part I of this report) is modified by SES background or general mental ability.

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[1] The author is director of Project MHSC-1, Antecedents of Educational Achievement, of which this study is a part. Appreciation is expressed to the many who have contributed to the project in the collection and coding of the data. Special appreciation is expressed to Mrs. Anita Green, Project Statistical Assistant, Miss Janet Modery, Project Secretary, and Mr. Michael Gold & Mrs. Gail Bleach, Project Clerks, for their contributions to the present study. We also wish to thank the personnel of the County Board of Education who have contributed so much to making the project possible.

Results of these comparisons may have implications for remedial programs and general instructional programs by indicating how important it is to take general mental ability or socio-economic level into account when attempting to assess underachievement in reading, predict its consequences, or remedy reading deficiency problems, generally, or in specific subpopulations such as the socially disadvantaged.

Separate analyses of the achievement groups were also conducted within the four race-by-sex samples that comprised the study population. The purpose of these analyses was to compare the differential relationships of reading achievement in these groups, rather than differences in performance across these groups *per se*. Previous analyses with these data (Lloyd, 1967a; Lloyd, 1967b) have shown significant differences in level of performance across both race and sex samples, and these have generally been in close agreement with differences found by other investigators. As a group, girls obtained higher scores on standardized tests, higher marks and grade point averages, were retained fewer times in elementary school, and had a lower dropout rate than boys. The majority of these differences were replicated across race. Differences between Negro and white students in test performance and socio-economic background were also similar to those reported by other investigators (Dreger & Miller, 1960; Deutsch, 1960; Kennedy, Van de Riet, & White, 1963; Stetler, 1959). The socio-economic status of the Negro students was primarily concentrated in the two lowest levels of the five-level SES index, their mean 6th grade IQ score was 87 in contrast to a mean score of 104 for whites, their mean achievement test performance was one grade below grade placement in the 6th grade and had dropped from a mean performance that was at grade level in the 3rd grade. Elementary school retentions and dropout rate were also greater in the Negro samples than in the white samples. Given these differences, the questions for investigation concerned whether the samples differed in regard to prevalence of underachievement in reading, relative to measured level of mental ability, and whether they differed in the relationship of underachievement in elementary school to later academic performance.

Method

Subjects

Subjects were 3651 6th grade students who had scores on both the IQ score and reading score that were used to define reading achievement groups. This sample was stratified (1) into high and low SES levels, and (2) into high and low IQ levels. In the 6th grade, the high SES group consisted of 1487 subjects; the low SES group, 1971 subjects. In the high IQ group there were 2157 subjects; in the low IQ group, 1494 subjects. Analyses were also performed with the individual race and sex samples that together made up the combined sample. These samples consisted of 1624 white males, 1600 white females, 231 Negro males, and 196 Negro females.

The number of subjects with data on later measures of achievement varied because of loss of subjects from the cohort through transfer or dropout and from the exclusion of subjects with missing information in the comparisons. Analyses on the relationship to high school dropout or graduation were limited to subjects known to have dropped out or graduated, eliminating transfers, whose ultimate outcome was indeterminate.

Variables

With few exceptions, the variables analyzed were the same as those described in Part 1 of the report. The score indicating discrepancy between predicted and obtained reading was derived from the regression of the IQ score of the California Test of Mental Maturity (CTMM IQ score) and the California Achievement Test Total Reading score (CAT Reading score), both administered in the 6th grade.

Stratification of the sample into high and low IQ levels was done on the basis of the 6th grade CTMM IQ score. Stratification into high and low socio-economic status levels (SES) was made according to the Hollingshead Two-Factor Index of Social Position (Hollingshead, 1957). This index consisted of a weighted composite of the occupational and educational levels (occupation weighted 7 and education weighted 4) of the subject's father as it was recorded in the school records when the subject was in the 6th grade.[2] The index consisted of five levels, with level 1 reflecting the highest educational and occupational background.

Dependent variables were classified as measures concurrent to the classification of subjects into reading achievement groups, measures of later academic performance, and measures of later behavior and outcome. Concurrent achievement measures were 6th grade language and arithmetic subtest scores of the CAT Battery and the grade point average for the 6th grade courses.

Measures of later academic performance consisted of yearly grade point averages, grades 7 through 12, grade point averages in specific course areas averaged over the years in which a subject was in school, and performance on standardized tests administered in the 7th and 9th grades.

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[2] In cases where information on the father's educational and occupational status was not available, or if the father was not living with the family, the index was computed from the education and occupation of the mother. Educational level was coded into three categories: elementary, high school, and beyond high school; coded 6, 4, and 1, respectively, in order to compute the Hollingshead Two-Factor Index of Social Position. The occupational level of the father consisted of a seven-category scale adapted from the occupational scale of the Index of Social Position (Hollingshead and Redlich, 1958). A summary of the seven occupational levels in this scale is as follows:

Level 1:	Higher executives, proprietors, and professionals
Level 2:	Lesser executives, proprietors, and professionals
Level 3:	Administrative, small business owners, minor and semi-professionals
Level 4:	Clerical, sales, and technicians
Level 5:	Skilled trades
Level 6:	Semi-skilled trades
Level 7:	Unskilled workers

The yearly grade point averages were the average of the final marks in courses receiving a full unit credit (mathematics, English, science, social studies, and foreign languages).[3]

Course-area grade point averages were calculated for 10 course areas: English, social studies, science, mathematics, business, vocational, foreign languages, art, physical education, and music.[4]

In calculating both types of grade point averages, course marks were assigned codes ranging from 5, for a mark of A, to 1, for a mark of E.

The standardized test scores were the reading average, arithmetic average, and language subtest scores from the Stanford Achievement Test (SAT) administered in the 7th grade, the reading average from the SAT administered in the 9th grade, and all of the subtests from the Iowa Test of Educational Development (ITED) administered in the 9th grade.[5]

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[3] For subjects withdrawing during the second semester of a year, the available marks for that year were averaged. Where a complete grade or certain courses were repeated because of failures, only the repeated course marks were included in the average. If a subject failed the same course twice and did not repeat it, the last failure, or mark of E, was counted in the average. In effect, this method of calculating the average made these variables measures of the best performance of a student in the more academic subjects at each grade level. Yearly grade point averages were based on a reduced sample of subjects at each successive grade level.

[4] Courses in speech, dramatics, and journalism were included in the English area; history, geography, and psychology in the social studies area, etc. The course area grade point averages were available for all subjects except those who transferred or dropped out in the 7th grade. The number of courses on which the average was based, however, differed among subjects. For the required courses, averages were available for approximately 3300 subjects; lower numbers of subjects had averages in elective courses.

Behavioral and outcome measures were the number of school activities participated in for grades 7 through 10, the number of absences in grades 7 through 12, dropout or graduation from high school, and employment or college attendance following high school graduation.

Procedures

In general, procedures were the same as those followed in the analysis of the combined samples (Part I). A discrepancy score that represented the difference between subjects' expected reading level and obtained reading level in the 6th grade was calculated. The reading discrepancy scores were derived from the regression of the IQ score and the reading score within each of the four race-by-sex samples. Three achievement groups were formed on the basis of the standard deviation of the discrepancy in each sample. This standard deviation was equivalent to the standard error of estimate (S.E.E.) for predicting the 6th grade CAT Reading score from the 6th grade CTMM IQ score. Underachievers had discrepancy scores below 1 S.E.E.; average achievers had discrepancy scores between + or - 1 S.E.E.; and overachievers had discrepancy scores above 1 S.E.E. The S.E.E.'s in the four race and sex samples were similar enough in size to allow the same cut-off score to be used in defining the achievement groups (the mean discrepancy score + or - .85). Only in the Negro female sample, where the S.E.E. was .768, did this procedure affect the classification of subjects into achievement groups. Because of the slightly smaller S.E.E. in this sample, slightly fewer subjects were classified as underachievers and overachievers by using the cut-off point of .85.[6] The achievement groups can also be described in terms of two other commonly-used units for describing achievement. First, in a normalized distribution, underachievers had a reading score two or more stanines below the score expected on the basis of mental ability. Second, since the discrepancy score was in grade equivalent units, underachievers were reading .9 grades or more below the level predicted on the basis of 6th grade IQ score.

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[5] Grade equivalent scores were coded for SAT tests. For the ITED tests standard scores were used.

In order to investigate the relationship of reading achievement to other performance measures at different levels of mental ability, two groups were formed on the basis of scores on the 6th grade CTMM. The high IQ level consisted of subjects with 6th grade CTMM IQ scores of 100 and above; the low IQ level consisted of subjects with scores below 100. For comparison of reading achievement in groups of different socio-economic status background, subjects were classified into two SES levels. The high SES level consisted of students whose parents were in levels 1, 2, and 3 of the two-factor index of social position; the low SES level consisted of subjects in levels 4 and 5 of the index.[7]

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[6] Discrepancy scores were rounded to one-tenth of a grade-equivalent score so that subjects with a score of -.9 or below were classified as underachievers and subjects with scores of +.9 or above were classified as overachievers. Four Negro females had scores of -.8 and would have been classified as underachievers by the S.E.E. in that sample, but were classified as average achievers for this analysis. One Negro female had a score of +.8 and was classified as an average achiever rather than as an overachiever.

Achievement groups were not matched on SES level. The method of defining achievement groups, however, did result in their being matched in mean IQ level in the combined samples. Differences on these measures within high and low stratifications and race-by-sex samples were assessed and are reported in the Results section.

The relationships of variables to reading achievement were assessed by mean difference tests across the three achievement groups or by cross-tabulation of frequencies across the three groups, with respective F tests and chi squares to determine the level of significant differences. In connection with analysis of variance comparisons, the omega^2 statistic was calculated to evaluate the degree of association between achievement groups and the dependent variables and to evaluate the relative strength of relationships to the achievement classification of different variables.[8]

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[7] The comparisons of high and low SES and IQ levels are reported for the combined samples, i.e., the underachievers, average achievers, and overachievers in all four race and sex samples. Since the majority of Negro subjects had IQ scores below 100 and were concentrated in the lower SES levels, most Negro subjects were included in the lower levels of these stratifications. Comparisons of high and low IQ and SES groups within the separate race-by-sex samples were made to determine possible interaction effects and to pinpoint specific subgroups contributing to significant differences across achievement groups. For these analyses, high and low IQ and SES were defined in the Negro samples to achieve a more balanced comparison. High and low IQ levels were defined as an IQ score of 86 and above and 85 and below, respectively. High SES was defined as levels 1 through 4 of the two-factor index; low SES consisted of level 5. These data will be referred to only when they add to or contradict the results obtained from stratifications in the combined samples.

Results

Distribution of Reading, IQ, and SES Scores in Samples and Stratifications

In Table 1, the mean performance on the 6th grade standardized tests is presented for the combined samples, the four race-by-sex samples, and the high and low SES and IQ groups. The mean IQ of the white samples was slightly higher than that of the standardization sample (103 for white males; 106 for white females). The mean IQ score for the Negro samples was almost one standard deviation below the mean of the standardization sample (85 for Negro males and 87 for Negro females). In both races, girls had higher scores than boys.

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[8] For a discussion of this statistic, see Hayes (1963). In the body of the report, the omega^2 statistic is expressed as the percentage of variance among achievement groups accounted for by a particular variable. Figures in the Appendix are in terms of the proportion of variance. The magnitude of the omega^2 statistic is partly affected by the size of the sample. This effect is opposite to the relationship of significance level and sample size, i.e., it is more likely to have a larger percentage of variance accounted for across groups in small samples than in large samples. In comparing the strength of associations in different groups, it is necessary that the groups be of similar size.

Table 1

Mean Performance on the 6th Grade Standardized Tests in the Combined Samples, High and Low SES and IQ Levels and Race and Sex Samples

		6th CTMM IQ	6th CAT Reading
Combined	M	102.32	5.83
(N=3651)	SD	17.00	1.51
High SES	M	108.52	6.40
(N=1487)	SD	15.60	1.45
Low SES	M	97.92	5.41
(N=1971)	SD	16.39	1.40
High IQ	M	113.75	6.66
(N=2157)	SD	9.69	1.18
Low IQ	M	85.82	4.62
(N=1494)	SD	10.50	1.06
White Males	M	103.26	5.76
(N=1624)	SD	16.76	1.55
White Females	M	105.62	6.21
(N=1600)	SD	15.14	1.38
Negro Males	M	85.42	4.42
(N=231)	SD	15.66	1.13
Negro Females	M	87.58	4.92
(N=196)	SD	15.87	1.16

In the high and low IQ stratifications, which were formed on the basis of scores on this test, the high IQ group had a mean IQ score of 114; the low IQ group had an IQ of 86, or approximately one standard deviation above and one standard deviation below the standardization mean of 100. As would be expected in dividing the distribution in half, the variance in the two IQ levels was reduced, with the standard deviation being approximately 10 at each level. Although the majority of the Negro subjects were included in the low IQ group, the converse, which the mean IQ score of 86 in the low IQ group might suggest, was not true. Only 340, or approximately one-fifth, of the 1494 low IQ subjects were Negro.

The high SES group had a mean IQ score of 109; the low SES group had a mean IQ of 98, showing a relationship between SES level and IQ performance. The standard deviation of IQ scores in the high and low SES levels was close to the standardization S.D. of 16, indicating that IQ was distributed within the high and low SES levels approximately the same as in the standardization sample.

In 6th grade reading level, the combined samples had a mean score of 5.8, which was .3 grade equivalents below the 50th percentile for the standardization norm group (6.1). The differences between race and sex samples and high and low stratifications on the reading score followed the same pattern as the differences in IQ score. Females in both races had a higher mean reading level than males. The mean reading score in the Negro samples was more than one grade below normative placement. As with the IQ score, the high and low IQ groups were separated more than the high and low SES groups in mean reading level. This reflects the higher correlation between IQ and reading level than between SES level and reading level.[9]

A further description of the distribution of CAT Reading scores is presented in Table 2, where the percentage of subjects in each of the standardization norm centile categories is given. In this table, underachievement or deficiency in reading in relation to grade placement can be determined for the samples of the study. With a commonly-used criterion of reading deficiency as a reading level two or more years below grade placement (which corresponds to scores in the first centile), 17.6% of the white male, 7.2% of the white female, 43.8% of the Negro male, and 26.2% of the Negro female samples would be classified as deficient in reading skills. Within both races, prevalence of reading deficiency among boys was twice as great as among girls using this criterion. The percentages of subjects reading below the 20th percentile (1.2 grades below grade placement) were 30.9% for white males, 17.3% for white females, 67.1% for Negro males, and 48.6% for Negro females.

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[9] In other analyses of these data, the correlation of SES level and 6th grade reading level in the white samples ranged from .31 to .35; the correlation of the CTMM IQ score and the CAT Reading score was approximately .80. IQ level and SES level correlations were from .31 to .33. All correlations in the Negro samples were .10 to .15 points lower than in the white samples.

Table 2

Distributions of the CAT Total Reading Score in Percentile and Grade Equivalent Categories for Race, Sex, and Combined Samples[a]

		Grade Equivalent									
		1.0-4.1	4.2-4.9	5.0-5.4	5.5-5.7	5.8-6.0	6.1-6.4	6.5-6.8	6.9-7.3	7.4-7.8	7.9-9.9
		Percentile									
		0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Combined Samples (N=3892)	N	593	508	532	301	294	343	349	362	247	363
	%	15.2	13.0	13.7	9.7	7.6	8.8	9.0	9.3	6.4	9.3
White Males (N=1742)	N	306	231	228	132	127	137	149	170	110	152
	%	17.6	13.3	13.1	7.6	7.3	7.9	8.6	9.8	6.3	8.7
White Females (N=1687)	N	122	171	218	131	146	191	183	186	133	206
	%	7.2	10.1	12.9	7.8	8.6	11.3	10.8	11.0	7.9	12.2
Negro Males (N=249)	N	109	58	45	11	9	5	6	3	1	2
	%	43.8	23.3	18.1	4.4	3.6	2.0	2.4	1.2	0.4	0.8
Negro Females (N=214)	N	56	48	41	27	12	10	11	3	3	3
	%	26.2	22.4	19.2	12.6	5.6	4.7	5.1	1.4	1.4	1.4

[a] Percentiles and grade equivalents from standardization norms. Manual, California Achievement Tests. Elementary Battery, 1950 edition. Los Angeles: California Test Bureau, 1951.

Percentage of Reading Deficiency Relative to Expected Reading Level

Underachievement in relation to expected reading level was defined as a CAT Reading score of .9 grade equivalents (2 stanines) or more below the score predicted by a subject's CTMM IQ score. The correlation between 6th CAT Reading subtest and the 6th CTMM, the regression coefficients to obtain the predicted reading score, and the standard errors of estimate in each of the samples (the standard deviation of the discrepancy between predicted and obtained reading scores) are presented in Table 3. Since the standard error of estimate in three of the four samples was between .8 and .9 grade equivalents, a single standard error of estimate (.85) was used to classify the three achievement groups.

In Table 4, the number and percentage of subjects classified as underachievers, average achievers, and overachievers in the race-by-sex samples and high and low SES and IQ groups are presented. In the white male and white female samples, the prevalence of underachievement in reading was approximately the same (15%). (This is in contrast to the much higher percentage of underachievers among males when the criterion of norm grade placement was used.) In the Negro samples, the percentage of subjects classified as underachievers was less than in the white samples, with 11.7% of the Negro males and 10.7% of the Negro females reading .9 grade units or more below their expected level (12.8% of the Negro females would be classified as underachievers if the smaller S.E.E. of that sample were used).

Table 3

Correlations Between 6th CAT Reading Subtest and 6th CTMM, Regression Coefficients for Predicted Reading Score, Standard Errors of Estimate, and Estimated Reliability of Classification

	r	a	b	S.E.E.	$S.D._{de}$[a]	p[b]
White Males	.82	-2.303	.0779	.885	.522	.045
White Females	.78	-1.240	.0705	.865	.454	.028
Negro Males	.61	.513	.0453	.856	.338	.006
Negro Females	.74	.242	.0535	.768	.372	.020

[a] Standard deviation of differences arising from errors of measurement (Thorndike, 1963). Formula includes S.D. on 6th CAT Reading and correlation between 6th CAT Reading and 6th CTMM scores obtained in each sample and reliability coefficients for the CAT Reading test (.94) and CTMM (.92) reported by the California Test Bureau.

[b] Probability of misclassification beyond 1 S.E.E. (one tail).

Table 4

Number and Percentage of Underachievers, Average Achievers, and Overachievers in the Combined Samples, High and Low SES and IQ Levels and Race and Sex Samples

		Underachievers (Below 1 S.E.E.)	Average Achievers (-1 S.E.E. to + 1 S.E.E.)	Overachievers (Above 1 S.E.E.)
Combined Samples	N	536	2537	578
	%	14.7	69.5	15.8
High SES	N	193	1001	293
	%	13.0	67.3	19.7
Low SES	N	315	1401	255
	%	16.0	71.1	12.9
High IQ	N	319	1495	343
	%	14.8	69.3	15.9
Low IQ	N	217	1042	235
	%	14.5	69.7	15.7
White Males	N	248	1105	271
	%	15.3	68.0	16.7
White Females	N	240	1116	244
	%	15.0	69.7	15.3
Negro Males	N	27	168	36
	%	11.7	72.7	15.6
Negro Females[a]	N	21	148	27
	%	10.7	75.5	13.8

[a] Classification in each sample was based on a standard error of .85. With the S.E.E. obtained in the Negro female sample (.77), 24 Negro females were classified as underachievers (12.8%), 143 as average achievers (72.9%), and 28 as overachievers (14.3%).

The similar percentage of Negro male and female underachievers also differed considerably from percentages obtained when the criterion of grade placement was used to define underachievement.

The probability of subjects being misclassified as underachievers solely because of errors of measurement (i.e., in the CAT Reading and CTMM scores) was estimated to be 4.5% in the white male sample, 2.8% in the white female sample, 0.6% in the Negro male sample, and 2.0% in the Negro female sample (Table 3). The higher reliability of the classification in the Negro samples resulted from the lower correlation between the reading score and IQ score in these samples. In the calculation of the standard deviation of differences arising from errors of measurement, the reliability coefficients for the CAT Reading test and the CTMM were assumed to be the same in the Negro samples as in normative samples for these tests, an assumption that may not be warranted. It is interesting, however, that when the estimated percentage of subjects misclassified as underachievers in each sample is subtracted from the percentage of underachievers reported in Table 4, the estimates of underachievement in all four samples are very similar (between 11% and 12%).[10] It can also be seen in Table 4 that as many or slightly more subjects were classified as overachievers than underachievers in the race-by-sex samples.

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[10] Subtraction of the percentage of the subjects that were possibly misclassified as underachievers provides the most conservative estimate of underachievement: 10.8% for white males, 12.2% for white females, 11.1% for Negro males, and 10.8% for Negro females.

When students with an IQ score above 100 were compared to those with an IQ below 100 it was found that the high and low IQ groups did not differ in the percentage of underachievers, average achievers, and overachievers. The high SES and low SES groups, however, did differ. Sixteen percent of subjects in the low SES level, or 3% more than in the high SES level, were classified as underachievers, and 19.7% of the high SES group, or 8% more than the low SES group, were classified as overachievers. Since the prevalence of underachievement was not different in the IQ groups, the higher prevalence of underachievement in low SES level could not be attributed to the association of SES and IQ. This would support the conclusion that socio-economic background is related to reading achievement independent of general mental ability inferred from the IQ score.

Differences Between Achievement Groups in IQ Score and SES Level

In the comparisons of the achievement groups that follow, it would be desirable that achievement groups stratified on SES level did not differ significantly in IQ score and that achievement groups in high and low IQ levels did not differ in SES level, so that differences among the achievement groups could be attributed to independent effects of the achievement classification. In the combined samples the achievement groups did not differ in 6th CTMM IQ score. It was also necessary, however, to determine whether the race and sex samples that made up the total population differed in IQ scores.

The mean IQ scores in the high and low stratifications and race-by-sex samples are presented in Table 5. There were no significant differences in IQ among the achievement groups in any of the four race-by-sex samples nor in the high SES and high IQ levels. In the low SES and low IQ levels, achievement groups did differ significantly in mean IQ score; however, in both cases underachievers had a higher mean than average achievers and overachievers. Because of the relationship of IQ level to achievement, differences in this direction would work against finding a significant relationship between underachievement in reading and lower performance on later achievement measures.

The mean SES levels in the high and low stratifications and race-by-sex samples are presented in Table 6. Significant differences across achievement groups in the high SES and high IQ levels were found, with overachievers having the highest mean SES. In both of these stratifications, significant differences resulted primarily from the higher SES level of white female overachievers and, secondarily, from higher levels of Negro female overachievers. Differences were not significant among males in the high levels of SES and IQ. In the low IQ level, there were not significant differences across achievement groups in any of the four race-by-sex samples; however, achievement groups did differ significantly in the combined low IQ group as a result of a summation of low level

Table 5

Mean Performance on the 6th Grade CTMM IQ Score of Under-, Average, and Overachievers in the Combined Samples, High and Low SES and IQ Levels and Race and Sex Samples

Group		Under-achievers	Average achievers	Over-achievers	F	omega^2
Combined samples	N	536	2537	578		
	M	103.10	102.25	101.92	.75	0.00
	SD	15.51	16.85	18.88		
High SES	N	193	1001	293		
	M	107.77	109.12	106.94	2.46	0.20
	SD	14.04	15.44	16.99		
Low SES	N	315	1401	255		
	M	100.52	97.77	95.53	6.76[a]	0.58
	SD	15.68	16.01	18.75		
High IQ	N	319	1495	343		
	M	113.61	113.53	114.82	2.50	0.14
	SD	9.11	9.76	9.85		
Low IQ	N	217	1042	235		
	M	87.66	86.06	83.10	11.65[b]	1.41
	SD	8.42	10.49	11.73		
White males	N	248	1105	271		
	M	103.43	103.48	102.22	.63	0.00
	SD	14.91	16.72	18.46		
White females	N	240	1116	244		
	M	106.08	105.55	105.47	.13	0.00
	SD	14.20	14.78	17.54		
Negro males	N	27	168	36		
	M	87.04	85.08	85.83	.19	0.00
	SD	12.74	15.57	18.23		
Negro females	N	21	148	27		
	M	86.00	87.66	88.37	.14	0.00
	SD	17.42	14.98	19.61		

[a] $p < .01$

[b] $p < .001$

Table 6

Mean SES Level of Under-, Average, and Overachievers in the Combined Samples, High and Low SES and IQ Ranges, and Separate Race and Sex Samples

Group		Under-achievers	Average achievers	Over-achievers	F	omega^2
Combined samples	N	508	2402	548		
	M	3.54	3.40	3.13	17.55[c]	0.95
	SD	1.08	1.17	1.25		
High SES	N	193	1001	293		
	M	2.39	2.24	2.17	3.96[a]	0.40
	SD	0.80	0.86	0.88		
Low SES	N	315	1401	255		
	M	4.24	4.23	4.23	0.08	0.00
	SD	0.43	0.42	0.42		
High IQ	N	305	1428	324		
	M	3.33	3.10	2.80	15.47[c]	1.39
	SD	1.13	1.21	1.26		
Low IQ	N	203	974	224		
	M	3.85	3.85	3.61	5.74[b]	0.67
	SD	0.90	0.95	1.05		
White males	N	235	1046	252		
	M	3.39	3.23	3.08	4.36[a]	0.44
	SD	1.10	1.15	1.21		
White females	N	228	1061	235		
	M	3.48	3.26	2.88	17.88[c]	2.17
	SD	1.02	1.12	1.20		
Negro males	N	25	159	35	0.45	0.00
	M	4.48	4.50	4.37		
	SD	0.59	0.76	0.73		
Negro females	N	20	136	26		
	M	4.70	4.55	4.19	3.33[a]	2.50
	SD	0.57	0.69	1.02		

Note.--Lower means indicate higher SES level.

[a] $p < .05$

[b] $p < .01$

[c] $p < .001$

relationships in the smaller samples. The major difference in SES in the low IQ level occurred between average achievers and overachievers; the mean SES level of underachievers and average achievers was the same. Significant differences in SES level in the race-by-sex samples showed the greatest difference to be in the white female sample, and as pointed out, primarily among high IQ and high SES white females.

In comparisons of achievement groups on later measures of achievement and behavior, it was considered that mental ability level was controlled. However, in some comparisons, particularly among achievement groups in the high SES and high IQ levels, differing SES background of the groups must be considered as potentially contributing to differences.[11]

Reading Level of Achievement Groups in Grades 6, 7, and 9

Comparison of the three achievement groups in the combined samples in reading level in grades 6, 7, and 9 showed that underachievers, as a group, performed significantly lower than average and overachievers in all three grades and remained below grade placement in all grades measured (Part I). There was also attrition in the number of subjects over grades 7 and 9 from missing data or school dropout. Attrition was greater in the lower levels of the performance distribution, which would lead to the expectation that the mean performance of the underachievers would improve from grade 7 to 9. This was not the case, however. The mean reading level relative to grade placement remained the same from grade 7 to 9, indicating that many underachievers fell farther behind in reading level over subsequent grades. Projection of the expected reading level in the 6th grade to the 7th and 9th grades also supported that only in a few cases did true underachievers raise their level of performance relative to grade placement over secondary school grades.

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[11] The relationship of reading achievement to socio-economic background measures and family characteristics is treated in more detail in Part III of this report.

Extension of these analyses was done in order to determine whether the same evidence for the enduring status of underachievement occurred in the different SES, IQ, race, and sex groupings.

It is necessary to consider two factors in interpreting the results of these comparisons. First, the tests administered in the 6th and 7th grades were from different publishers and, hence, were based on different normative samples. In the analysis of the combined samples (Part I), it appeared that neither of the two SAT norms (modal-age and total-grade norms) were directly related to the CAT norms.[12] Second, there was an attrition of subjects through transfer and dropout between grades 6 and 9 resulting in a smaller number of subjects in the groups in successive years. Since there was evidence that attrition was greatest in the lower levels of performance, it was expected that mean scores of groups would rise over successive grades.[13]

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[12] In the following comparison, the modal-age norms of the SAT were used for comparison of performance across grades 6 to 9 because they showed the least deviation from the performance of groups on the CAT norms. Differences in the two tests would not affect comparison of the relative performance of the achievement groups because differences were the same for all groups. Differences between SAT total-group and modal-age norms are fairly constant

The mean reading level in grades 6, 7, and 9 of the achievement groups in the race-by-sex samples is presented in Table 7. In both the white male and white female samples, mean differences across achievement groups were significant at all three testings ($p < .001$), with underachievers reading below grade placement and below average achievers in each grade. There was some decrease over grades in the advantage held by overachievers and a slight increase in performance of underachievers, which could result from regression of scores and attrition of subjects. The omega^2 statistic reflects this increased similarity in the groups over grades, showing a decrease in the percentage of variance across groups accounted for from over 20% in the 6th grade to 5% in the 9th grade. The significance levels and percentage of variance accounted for by these

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over the percentile distribution, with total-group grade equivalents being .5 and .3 lower than modal-age (grades 7 and 9, respectively). An approximate conversion to total-grade norm placement would therefore place the mean performance of underachievers approximately .5 and .3 grade equivalents closer to grade-level and overachievers approximately .5 and .3 grade equivalents higher than grade-level.

[13] Some regression toward the mean of the extreme groups (underachievers and overachievers) would also be expected on retest.

Table 7

Mean Reading Level of Under-, Average, and Overachievers in the 6th, 7th, and 9th Grades

		Under-achievers	Average achievers	Over-achievers	F	omega^2
			WHITE MALE SAMPLE			
6th CAT Reading Total	N	248	1105	271		
	M	4.43	5.75	7.02	230.63^a	22.05
	SD	1.15	1.38	1.53		
7th SAT Reading Average	N	210	956	231		
	M	5.81	6.84	7.88	54.77^a	7.15
	SD	1.81	2.09	2.25		
9th SAT Reading Average	N	138	652	154		
	M	8.56	9.62	10.24	25.32^a	4.90
	SD	2.23	2.03	1.93		
			WHITE FEMALE SAMPLE			
6th CAT Reading Total	N	240	1116	244		
	M	4.92	6.19	7.54	302.02^a	27.34
	SD	1.07	1.15	1.36		
7th SAT Reading Average	N	212	989	209		
	M	6.28	7.26	8.46	72.62^a	9.22
	SD	1.64	1.88	2.02		
9th SAT Reading Average	N	161	740	151		
	M	9.00	9.73	10.61	28.66^a	5.00
	SD	1.90	1.89	1.78		

$^a p < .001$

Table 7 (continued)

Mean Reading Level of Under-, Average, and Overachievers in the 6th, 7th, and 9th Grades

		Under-achievers	Average achievers	Over-achievers	F	omega^2
			NEGRO MALE SAMPLE			
6th CAT Reading Total	N	27	168	36		
	M	3.17	4.32	5.81	72.81[a]	38.34
	SD	.69	.88	1.04		
7th SAT Reading Average	N	18	129	24		
	M	4.15	4.43	5.21	6.17[a]	5.71
	SD	.87	1.11	1.22		
9th SAT Reading Average	N	4	24	9		
	M	5.70	5.69	7.08	2.91	9.37
	SD	.97	1.45	1.78		
			NEGRO FEMALE SAMPLE			
6th CAT Reading Total	N	21	148	27		
	M	3.50	4.88	6.26	51.93[a]	34.20
	SD	.88	.91	1.12		
7th SAT Reading Average	N	13	106	19		
	M	4.44	4.90	5.68	6.23[a]	7.04
	SD	.75	1.04	1.25		
9th SAT Reading Average	N	3	33	6		
	M	5.67	6.94	7.38	.92	.00
	SD	2.10	1.66	2.44		

[a] $p < .001$

measures in the white male and white female samples were very similar to the results with the combined sample, and, except for the consistently higher performance of white females in corresponding achievement groups, there was no significant difference in performance of achievement groups related to sex.

In both of the Negro samples, achievement groups were significantly different in mean reading level in the 6th and 7th grades, with underachievers reading below average achievers in both grades. In both Negro male and Negro female samples, there was a marked regression of mean scores in the 7th grade testing. Underachievers showed an advance of one grade level. Average achievers showed very little change in grade placement, and overachievers had a mean grade placement that was actually lower than that obtained in the 6th grade. Possible effects of the different tests in these two grades make it difficult to assess the actual progress of the three groups. The overachievers, however, remained significantly higher in mean reading level than average achievers in the 7th grade. Because of the large number of missing scores, performance on the 9th SAT may not be a reliable indication of reading achievement in the Negro samples.[14] Although achievement groups were not significantly different on this test, the trend of means was the same as in the 7th grade, with overachievers reading at a higher level and underachievers reading at the same level (Negro male sample) or a lower level (Negro female sample) than average achievers. All achievement groups showed an advance in mean performance in the 9th grade; however, no group had an increase equal to the two grades between testings. This resulted in a drop in mean performance relative to grade placement from grades 6 to 9 for all achievement groups.

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[14] Missing data on the 9th SAT Reading test did not result primarily from attrition through dropout or transfer. With contemplated changes in the county testing program that year, both the SAT and ITED batteries were given. It is possible that the SAT was not given in all schools or the records were not kept.

A further comparison of achievement groups in 9th grade reading level could be made from results on the two reading tests from the ITED (Test 5: Ability to Interpret Reading Materials in the Social Studies, and Test 6: Ability to Interpret Reading Materials in the Natural Sciences). Since the ITED performance was expressed in terms of standard scores, the only comparable unit available to compare reading level across the CAT, SAT, and ITED was the percentile equivalent of the mean scores for the achievement groups. These percentiles are presented in Table 8.

The percentile equivalent of the means on the ITED was higher than on the SAT in all achievement groups and samples.[15] In the white samples, underachievers performed at about the 50th percentile

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[15] Difference in content of these tests could be a factor contributing to different performance levels. Scores from ITED tests primarily reflected reading comprehension, whereas the CAT and SAT scores were combinations of comprehension and vocabulary or word meaning subtests. Performance of achievement groups on these subtests was not compared. Data for the 6th CAT comprehension and vocabulary and the 7th SAT paragraph meaning and word meaning subtests are included in the Appendix.

Table 8

Norm Percentile Rank of Mean Reading Test Scores of Under-, Average, and Overachievers

	Under-achievers	Average achievers	Over-achievers
	WHITE MALE SAMPLE		
6th CAT Reading Total	13	37	73
7th SAT Reading Average	34	50	71
9th SAT Reading Average	37	52	60
9th ITED Social Studies Reading	49	66	75
9th ITED Natural Science Reading	47	64	71
	WHITE FEMALE SAMPLE		
6th CAT Reading Total	19	53	83
7th SAT Reading Average	42	62	79
9th SAT Reading Average	42	54	68
9th ITED Social Studies Reading	53	66	77
9th ITED Natural Science Reading	48	59	76
	NEGRO MALE SAMPLE		
6th CAT Reading Total	2	11	40
7th SAT Reading Average	9	10	21
9th SAT Reading Average	5	5	18[a]
9th ITED Social Studies Reading	5	20	32
9th ITED Natural Science Reading	14	22	29[a]
	NEGRO FEMALE SAMPLE		
6th CAT Reading Total	5	19	55
7th SAT Reading Average	10	16	31
9th SAT Reading Average	5	16	21[a]
9th ITED Social Studies Reading	22	28	51
9th ITED Natural Science Reading	14	20	28[a]

[a] Mean difference across groups not significant.

on the ITED reading test. Their performance, however, was significantly below that of average and overachievers (means and significance tests are presented in Table 16, page 65). In the Negro samples, the percentile figures indicated that the lack of significant difference on the 9th SAT reading average resulted more from a drop in the performance of average and overachievers rather than an increase in the performance of underachievers. On both ITED reading tests, the groups were more widely separated. Differences between achievement groups in social studies reading was significant in both the Negro male and Negro female samples. Underachievers also had a mean performance below average and overachievers on the ITED natural science reading; however, differences were not statistically significant in either sample.

The mean reading scores in the 6th, 7th, and 9th grades of the high IQ and low IQ achievement groups are presented in Table 9. Mean differences across the achievement groups were significant at all three testings ($p < .001$), with underachievers reading at a level below average achievers of similar IQ. In both the high and low IQ levels, percentage of variance accounted for across the achievement groups decreased over successive grades. The percentage figures also indicated that the achievement groups in the high IQ range were more widely separated than those in the low IQ range. In Figure 1, the mean scores for the high and low IQ achievement groups are shown in relation to the normative grade level for the

Table 9

Mean Reading Level of High and Low IQ Under-, Average, and Overachievers in the 6th, 7th, and 9th Grades

		Under-achievers	Average achievers	Over-achievers	F	omega^2
			HIGH IQ			
6th CAT Reading Total	N	319	1495	343		
	M	5.28	6.63	8.09	839.49[a]	43.74
	SD	.85	.88	.91		
7th SAT Reading Average	N	282	1306	289		
	M	6.66	7.86	9.16	149.27[a]	13.64
	SD	1.62	1.76	1.69		
9th SAT Reading Average	N	211	966	201		
	M	9.47	10.47	11.32	86.41[a]	11.03
	SD	1.73	1.45	.94		
			LOW IQ			
6th CAT Reading Total	N	217	1042	235		
	M	3.48	4.60	5.73	386.21[a]	34.02
	SD	.66	.87	.97		
7th SAT Reading Average	N	171	874	194		
	M	4.70	5.20	6.04	50.12[a]	7.35
	SD	1.17	1.31	1.52		
9th SAT Reading Average	N	95	483	119		
	M	7.08	7.70	8.50	15.92[a]	4.11
	SD	1.93	1.81	2.03		

[a] $p < .001$

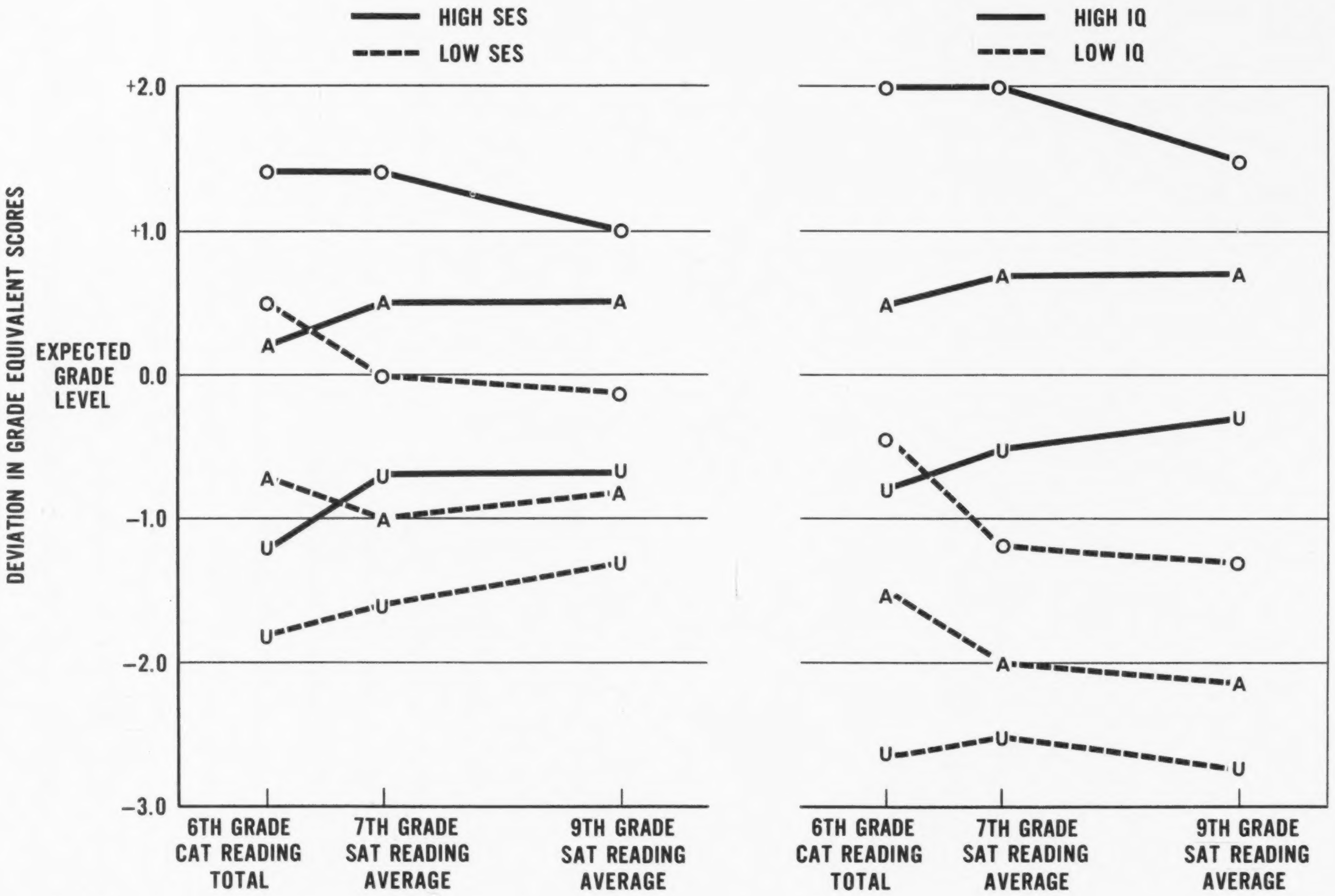
time of testing. Although there was a decrease in the percentage of variance across groups in the 7th and 9th grades (i.e., an increase in the variability of scores within each group in later grades), the plots in Figure 1 show that with the exception of a slight gain relative to grade placement of the high IQ underachievers and the slight loss relative to grade placement of all three low IQ achievement groups, the mean performance of all groups changed very little.

The results showed a strong relationship of IQ test performance to reading achievement in later grades. Average achievers in the high IQ level were reading .5 grade units above grade placement; whereas, average achievers in the low IQ level were reading 1.5 to 2.0 grade units below grade placement. High IQ underachievers were reading at a higher level than low IQ overachievers in the 7th and 9th grades. High IQ underachievers had a reading level that was below grade placement, however, and much lower than high IQ average achievers. The relationship of 6th grade IQ level to reading performance was also independent of the relationship of the reading achievement classification in the 6th grade. Within both IQ levels, later reading performance was significantly different for under-, average, and overachievers.

The slight loss relative to grade placement from grades 7 to 9 in the low IQ groups did not appear on inspection to be statistically significant, since the mean loss was not greater

FIGURE 1

MEAN READING LEVEL OF UNDERACHIEVERS (U), AVERAGE ACHIEVERS (A), AND OVERACHIEVERS (O) CORRECTED FOR GRADE LEVEL



than .5 grade units in any group and the standard deviation of scores on these testings was 1.0 to 2.0 grade units. This was not the pattern, however, that would be expected from the regression of scores and attrition of subjects between these grades. (The expected pattern was that reflected in the performance of high and low SES groups shown in the lefthand portion of Figure 1.) Since all low IQ achievement groups showed a decrease relative to grade placement, the effect was not related to the under-, average, and overachievement phenomena, but rather reflected an interaction between IQ level and reading achievement. Although all groups gained in reading skills from grades 6 to 9, the gain of the low IQ groups was less than the approximately 3.5 grade-years between tests; hence, there was decrease relative to grade placement. On the other hand, high IQ average and underachievers maintained a gain equal to or slightly greater than normative expectation over these grades. Although somewhat aside from the question of the effects of underachievement in reading, the difference in achievement gain as a function of level of general ability and level of reading has implications for expectation of pupil performance. Students whose IQ and reading scores are low in the 6th grade, other factors equal, should be expected to show a slow acquisition and development of skills in later grades, resulting in a performance below the norm through successive grades (Tilden, 1953).[16]

Comparisons of the high and low SES achievement groups on the 6th, 7th, and 9th grade reading tests are presented in Table 10 and Figure 1. As in the IQ stratification, differences among achievement groups were significant in both high and low SES levels on all tests. Within both high and low levels, underachievers remained below average achievers in all grades. The percentage of variance accounted for across achievement groups was less than that accounted for in the IQ stratifications, and the over-all relationship of SES to reading achievement was less than that of the IQ score, as reflected in the smaller range of mean scores across the six groups (see Figure 1).[17]

Although there was some reversal in the performance of groups from grades 6 to 7 (e.g., low SES overachievers had a higher mean score than high SES average achievers in the 6th grade, but a lower mean score in the 7th grade), comparisons were across different tests and standardization norms. From grades 7 to 9 the mean performance of all achievement groups changed very little, indicating stability in the status of under-, average, or

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[16] Slow gain resulting in loss relative to grade placement in the Negro male and Negro female samples may also be associated with low IQ and reading test performance levels of these samples in the 6th grade.

[17] Some of the differences between the high and low SES groups reflect the differences between high and low IQ groups since these measures are correlated, i.e., high SES groups had significantly higher IQ scores than low SES groups.

Table 10

Mean Reading Level of High and Low SES Under-, Average, and Overachievers in the 6th, 7th, and 9th Grades

		Under-achievers	Average achievers	Over-achievers	F	omega^2
			HIGH SES			
6th CAT Reading Total	N	193	1001	293		
	M	4.93	6.35	7.53	252.15[a]	25.25
	SD	1.10	1.25	1.36		
7th SAT Reading Average	N	170	893	247		
	M	6.46	7.68	8.56	54.76[a]	7.58
	SD	1.79	2.03	2.08		
9th SAT Reading Average	N	124	644	173		
	M	9.15	10.32	10.75	32.55[a]	6.28
	SD	2.03	1.69	1.68		
			LOW SES			
6th CAT Reading Total	N	315	1401	255		
	M	4.34	5.43	6.63	234.54[a]	19.16
	SD	1.16	1.24	1.44		
7th SAT Reading Average	N	272	1237	225		
	M	5.62	6.20	7.25	47.96[a]	5.14
	SD	1.66	1.85	2.17		
9th SAT Reading Average	N	178	777	142		
	M	8.49	8.95	9.72	13.68[a]	2.26
	SD	2.09	2.09	2.12		

[a] $p < .001$

overachievement seen in the other comparisons. Although SES level was related to achievement in reading over and above IQ level, in that a higher percentage in the low SES group were underachievers than in the high SES group, the pattern of underachievement was similar. Both high and low SES underachievers were reading below grade level and below average achievers of comparable SES level, and, as a group, remained underachievers to at least the time of the 9th grade testing.

Relationship of Reading Achievement to Other Academic Performance Measures

In the comparisons of the performance of underachievers, average achievers and overachievers in the combined samples (Part I), it was found that underachievers in reading, as a group, performed significantly lower than average or overachievers in other scholastic areas in the 6th grade and in grade point average and test score performance throughout secondary school. Achievement measures used to compare groups were grade point averages for full unit courses in grades 7 through 12, grade point averages in subject matter areas that were averaged over the years that a student was in school, the 6th grade CAT Arithmetic and Language scores, the 7th grade SAT Arithmetic and Language scores, and the scores on the nine subtests of the ITED given in the second semester of the 9th grade.

When the same measures were used to compare the performance of under-, average, and overachievers within high and low IQ and SES levels and in the four race-by-sex samples, the pattern of performance was generally the same as found in the combined samples, namely, within each of these subgroups underachievers consistently performed at a lower level than average and overachievers of the same group. With the general conclusion that the relationships of underachievement in reading to other academic measures is essentially the same within, and therefore largely independent of, race, sex, high or low SES background, and high or low mental ability, the presentation of the results will focus on examples of this pattern and data indicating where exceptions to the pattern may exist. Complete statistical data for measures only partially described or tabled in the text can be found in the Appendix.

Yearly Grade Point Averages. The mean grade point average in the 6th grade and the mean full-unit-course grade point averages in grades 7 to 12 are presented for the achievement groups in the race and sex samples in Table 11. In the two white samples, differences across achievement groups were significant in each grade ($p < .001$), with underachievers receiving lower marks than average achievers in all grades. The percentage of variance accounted for across groups decreased over successive grades. There was no difference between the pattern of performance found in the white male and white female samples, or from that found in the combined sample,

Table 11

Mean Grade Point Average of Under-, Average, and Overachievers in Grades 6 Through 12

Grade	N of Sample	Under-achievers	Average achievers	Over achievers	F	omega^2
			WHITE MALE SAMPLE			
6	1498	1.67	1.91	2.09	44.37[c]	5.47
7	1471	2.57	3.04	3.38	40.71[c]	5.12
8	1594	2.59	2.98	3.34	29.72[c]	4.01
9	1296	2.64	2.94	3.15	14.98[c]	2.11
10	1193	2.42	2.66	2.90	11.68[c]	1.76
11	975	2.52	2.76	2.90	7.89[c]	1.39
12	878	2.70	2.97	3.14	10.99[c]	2.22
			WHITE FEMALE SAMPLE			
6	1505	1.84	2.08	2.31	55.74[c]	6.78
7	1450	3.15	3.54	3.98	40.49[c]	5.16
8	1372	3.08	3.42	3.82	28.78[c]	3.89
9	1310	3.05	3.32	3.65	21.29[c]	3.00
10	1235	2.82	3.03	3.39	18.18[c]	2.71
11	1089	2.92	3.11	3.43	13.91[c]	2.32
12	987	3.23	3.44	3.67	11.83[c]	2.15
			NEGRO MALE SAMPLE			
6	222	1.50	1.71	2.09	12.73[c]	9.56
7	214	2.42	2.69	3.08	4.97[a]	3.58
8	201	2.12	2.52	2.99	7.89[c]	6.41
9	184	2.29	2.48	2.75	2.09	1.26
10	148	2.26	2.51	2.76	2.37	1.82
11	128	2.69	2.65	2.84	.61	0.00
12	109	2.54	2.68	2.94	1.72	1.31

(continued)

Table 11 (continued)

Grade	N of Sample	Under-achievers	Average achievers	Over achievers	F	omega^2
			NEGRO FEMALE SAMPLE			
6	187	1.72	1.92	2.27	5.80^b	4.88
7	175	2.81	3.22	3.56	3.07^a	2.31
8	167	2.54	3.13	3.42	4.05^c	3.52
9	153	2.61	2.99	3.44	2.78	2.28
10	129	2.76	2.92	3.41	2.70	2.57
11	101	3.25	2.97	3.11	.60	0.00
12	88	2.98	2.90	3.16	.83	0.00

Note.--6th grade average based on three possible marks: unsatisfactory, satisfactory, and outstanding, coded 1, 2, and 3, respectively. Averages in grades 7 to 12 based on five letter grades E to A, coded 1 to 5, respectively.

$^a p < .05$

$^b p < .01$

$^c p < .001$

except for the higher mean grade point averages in the female sample.

In the Negro male and Negro female samples, underachievers had significantly lower grade point averages than average or overachievers in grades 6, 7, and 8. In grades 9 and 10, the trend of means across groups was the same; however, differences were not statistically significant. In grades 11 and 12, the grade point averages of the overachievement groups were higher than those of average achievers; however, average and underachievers did not differ in their course performance. As in the white samples, females consistently had higher mean grade point averages than males. In fact, in the Negro male sample, only overachievers maintained an average of "C" in the more academic subjects from grades 7 through 12.[18]

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[18] The finding that girls received higher marks than boys is consistent with findings in other studies (Anastasi, 1958). Girls' higher evaluation in coursework was found in both the white and Negro samples over all secondary school grades. Girls had higher grade point averages in all subject areas (with the exception of physical education), including the areas of science and mathematics, where the mean achievement test performance (9th grade ITED) of boys was higher than that of girls. The extent of these differences in relation to reading achievement status also showed that the class performance of girls was evaluated more highly than that of boys. In all secondary school grades, white female underachievers had higher grade point averages than white male average achievers. With the exception of the 8th grade, where Negro female underachievers and Negro male average achievers had the same grade point average, Negro female underachievers had higher GPA's than Negro male average achievers. Further, in both races, male overachievers had lower grade point averages in the 11th and 12th grades than female underachievers. Female underachievers had higher grade point averages than male average achievers in all course areas with the

Except for the indication that Negro underachievers performed as well as Negro average achievers in grades 11 and 12, the findings in the Negro samples paralleled those in the white samples.[19]

The mean yearly grade point averages for the high IQ and low IQ achievement groups are shown in Figure 2. The pattern of coursework performance of achievement groups in high and low IQ levels was the same as that found for reading achievement test performance. Mean differences across achievement groups were significant in all secondary school grades, with underachievers having a mean grade point average below average achievers of similar IQ.[20] In both high and low IQ levels, the percentage of variance accounted for across achievement groups decreased over successive grades.

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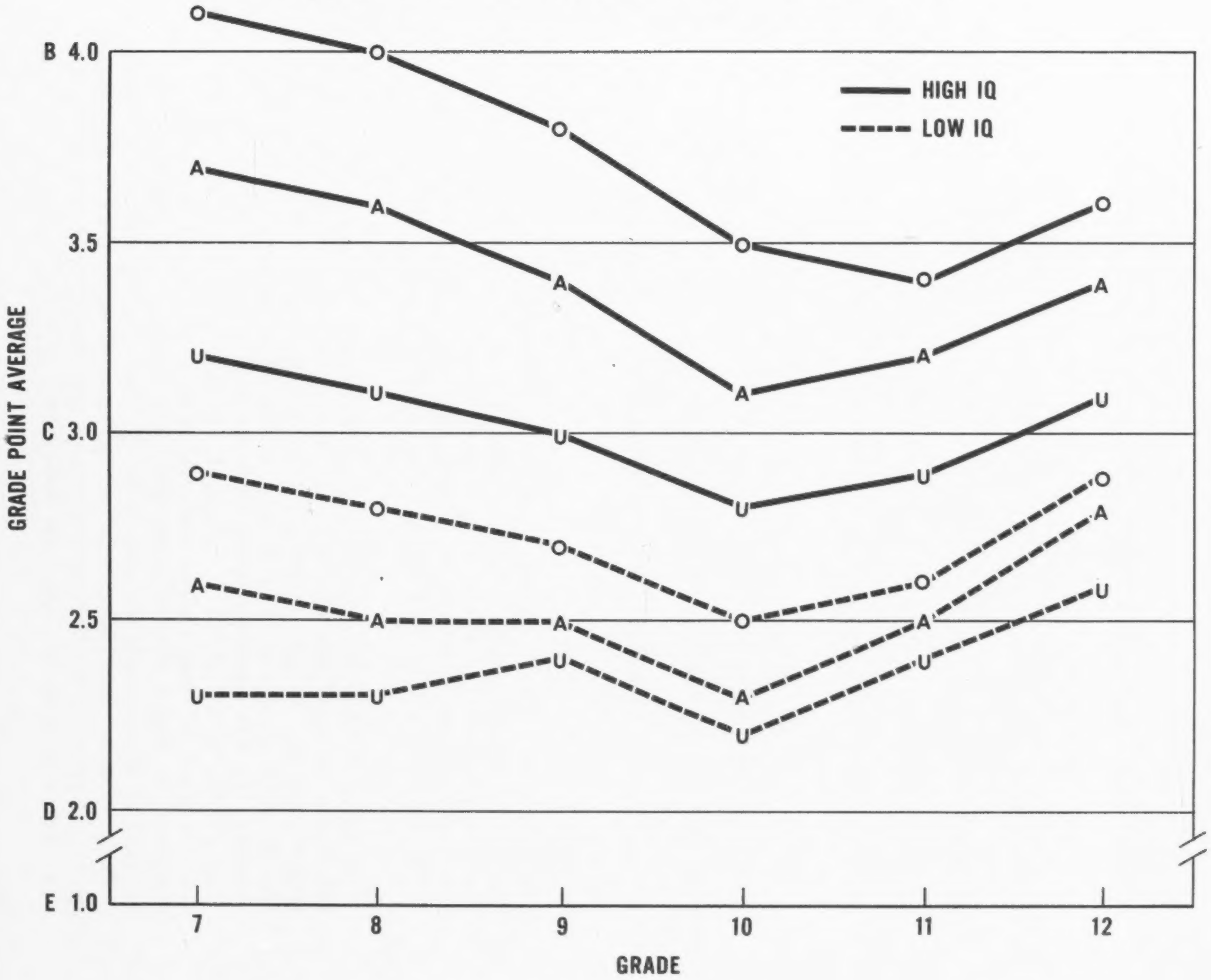
exception of science (white samples) and mathematics (Negro samples). White female underachievers even had higher grade point averages than white male overachievers in business, foreign languages, music, and art. In the Negro samples, these same differences existed in foreign languages and art.

[19] In interpreting this difference between the race groups, it is necessary to consider the greater attrition of subjects in the Negro samples, largely through dropout from high school. Although the dropout rate was high in all achievement groups in the Negro samples, it was highest among underachievers, so that by the 11th grade, grade point averages were only available for 11 of the original 27 Negro male underachievers (42%) and 6 of the original 21 Negro female underachievers (29%). Considering the selection that occurred, the finding that the 11 Negro male and 6 Negro female underachievers who graduated were receiving course marks comparable to those of average achievers does not contrast that greatly from the general findings.

[20] Differences in the high IQ group were significant at $p < .001$ in all grades. In the low IQ group, differences were significant at $p < .001$ in grades 7 to 9, and at $p < .01$ in grades 10 to 12.

FIGURE 2
MEAN GRADE POINT AVERAGES FOR HIGH AND LOW IQ UNDERACHIEVERS (U), AVERAGE ACHIEVERS (A), AND OVERACHIEVERS (O)

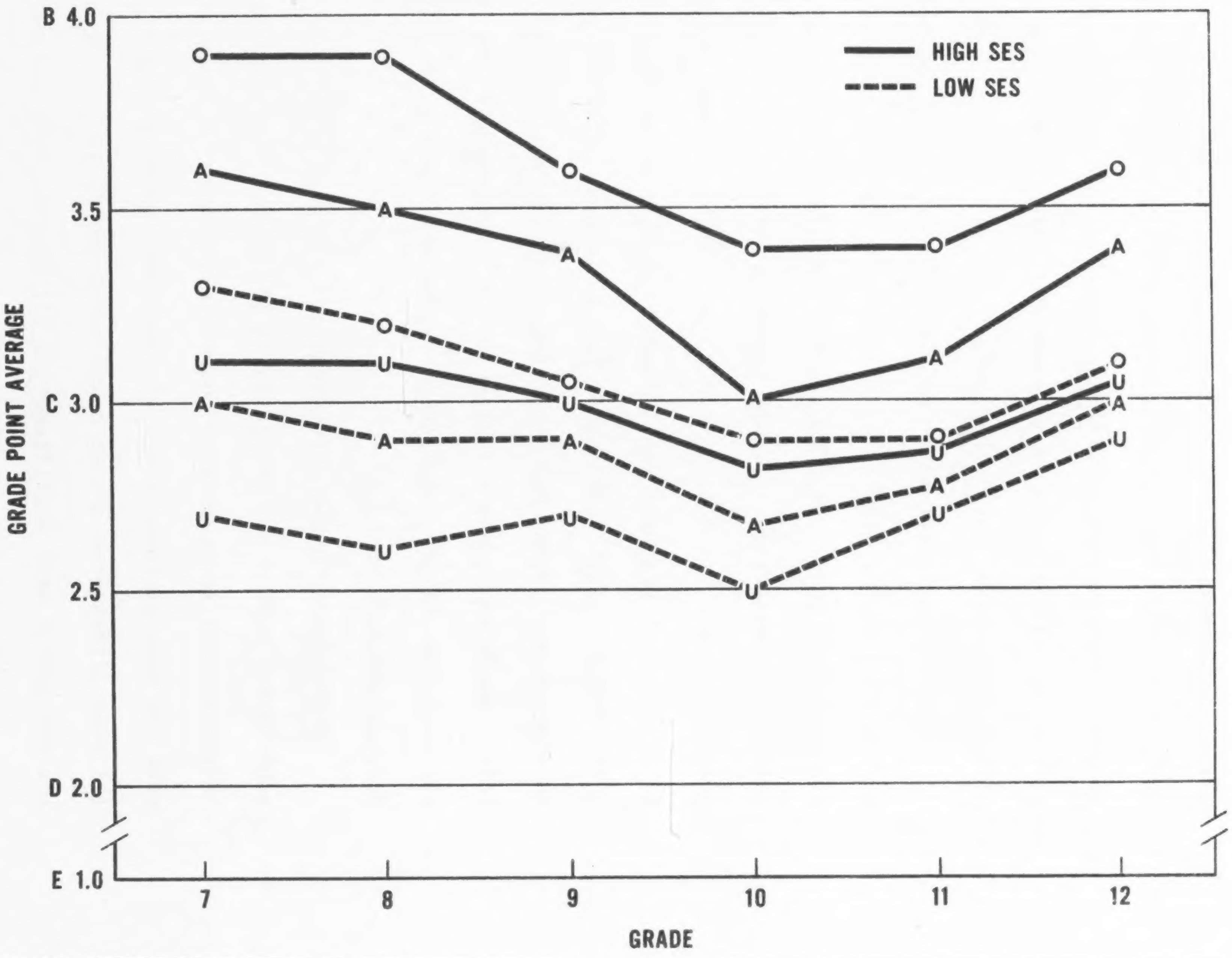


In the high IQ group, the percentage of variance accounted for across achievement groups was greater than in the low IQ range, 7.1% in the 7th grade, decreasing to 2.5% in the 11th and 12th grades. The percentage of variance accounted for across groups in the low IQ range was 4.7% in the 7th grade, decreasing to 1% in the 10th, 11th, and 12th grades.

The strong relationship of IQ scores to course performance can be seen in the wide separation of the high and low average achievement groups. High IQ average achievers had a grade point average approximately 1.0 (one letter grade) higher than low IQ average achievers. There was also no overlap in mean performance of achievement groups; high IQ underachievers maintained a higher grade point average than low IQ overachievers. Further, all low IQ achievement groups had mean grade point averages below the letter grade of C, whereas high IQ level achievement groups, with the exception of the underachievers, maintained a grade point average above C.

Mean yearly grade point averages for high and low SES achievement groups are presented in Figure 3. The relationships of achievement in reading to course performance in these groups were the same as those given for high and low IQ groups. That is, (1) mean differences across achievement groups in both high and low SES levels were significant in all grades, with underachievers having grade point averages below average achievers of similar SES background; (2) in both high and low SES levels, the percentage

FIGURE 3
MEAN GRADE POINT AVERAGES FOR HIGH AND LOW SES UNDERACHIEVERS (U), AVERAGE ACHIEVERS (A), AND OVERACHIEVERS (O)



of variance accounted for across the achievement groups decreased over successive grades; and (3) the separation of achievement groups was greater in the high SES level than in the low SES level.[21] The over-all relationship of SES to coursework performance was not as great as that of IQ level. The mean grade point average of high SES average achievers was approximately .5 units above that of low SES average achievers. Low SES overachievers maintained a grade point average that was slightly higher than that of high SES underachievers.

Course-Area Grade Point Averages. Achievement groups in the combined samples were found to differ significantly on mean grade point averages in all secondary school course areas, with underachievers having the lowest performance of the three groups (Part I). In courses required of all students, the performance of underachievers was closer to that of average achievers in science and mathematics than in English and social studies, and, with the exception of foreign language courses, underachievers were not as far below average achievers in elective course areas (foreign languages, music, and art) and in curriculum course areas (business and vocational).[22] The mean course-area grade point averages of underachievers in the SES and IQ groups and race and sex samples are presented in Table 12.

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[21] Levels of significance of the differences between achievement groups were the same as found in the high and low IQ groups, $p < .001$ in all grades for the high SES group, $p < .001$ in grades 7 to 9 and $p < .01$ in grades 10 to 12 in the low SES group.

[22] The business and vocational course areas correspond to two of the four curricula in grades 9 through 12, the other two being academic and general.

In the required course areas of English, social studies, science, and mathematics, achievement groups in high and low SES and IQ stratifications and in the race and sex samples showed the same differences in coursework performance found in the combined samples. Differences among achievement groups were highly significant in both levels of IQ and SES and in the white male and white female samples ($p < .001$). With two exceptions, underachievers in the Negro male and Negro female samples also performed significantly lower than average or overachievers in required courses ($p < .05$). Although Negro male underachievers were not significantly lower in science GPA, and Negro female underachievers were not significantly lower in English GPA, the trend of means across groups in these course areas was the same, and differences approached significance.

In business, vocational, foreign language, music, and art grade point averages, there was a greater separation in the mean performance of achievement groups in the high SES and high IQ levels than in the corresponding low levels. In the high IQ and SES levels, differences among achievement groups were significant ($p < .001$) in all course areas. In the low SES and IQ levels, significant differences were not found in all areas. Where differences were not significant, however,

Table 12

Mean Course Area Grade Point Averages of Underachievers, Grade Units Below Mean of Average Achievers, and Percentage of Variance Accounted for Across Three Achievement Groups

Group	English	Social Studies	Science	Mathematics	Business	Vocational	Foreign Language	Music	Art
Combined Samples									
Mean	2.7	2.7	2.6	2.6	2.7	3.2	2.4	3.4	3.2
Difference	.3	.3	.3	.3	.1	.2	.4	.3	.2
% Variance	3.8^c	3.9^c	2.3^c	2.5^c	$.8^c$	1.8^c	2.6^c	1.7^c	$.8^c$
High SES									
Mean	3.0	3.0	2.8	2.9	2.8	3.4	2.4	3.6	3.5
Difference	.3	.4	.3	.3	.2	.3	.6	.4	.2
% Variance	4.3^c	4.7^c	3.4^c	2.2^c	1.9^c	2.5^c	3.8^c	2.1^c	1.0^c
Low SES									
Mean	2.5	2.6	2.5	2.5	2.6	3.1	2.3	3.3	3.1
Difference	.3	.2	.2	.2	.1	.1	.3	.2	.2
% Variance	2.2^c	2.4^c	$.8^c$	1.9^c	---	$.7^c$	.5	$.9^c$	$.3^a$
High IQ									
Mean	3.0	3.0	2.8	3.0	2.8	3.4	2.5	3.7	3.5
Difference	.4	.5	.4	.3	.3	.3	.5	.3	.2
% Variance	6.0^c	6.4^c	4.5^c	4.2^c	2.3^c	3.0^c	4.0^c	2.3^c	1.3^c
Low IQ									
Mean	2.2	2.2	2.2	2.2	2.3	2.9	1.8	2.9	2.7
Difference	.2	.2	.1	.2	.0	.1	.2	.3	.3
% Variance	4.3^c	4.1^c	1.2^c	2.3^c	---	1.4^c	2.2^a	1.9^c	$.7^b$

(continued)

Table 12 (continued)

Group	English	Social Studies	Science	Mathematics	Business	Vocational	Foreign Language	Music	Art
White Males									
Mean	2.4	2.5	2.4	2.4	2.3	3.1	2.0	3.1	2.9
Difference	.4	.4	.3	.4	.3	.2	.5	.3	.2
% Variance	5.0^c	4.3^c	1.9^c	3.9^c	1.1^a	1.3^c	2.2^c	2.0^c	$.6^b$
White Females									
Mean	3.0	3.0	2.8	3.0	2.9	3.4	2.8	3.8	3.6
Difference	.3	.3	.3	.2	.1	.2	.4	.3	.3
% Variance	4.5^c	4.9^c	3.2^c	2.1^c	$.8^b$	2.5^c	4.0^c	2.5^c	1.7^c
Negro Males									
Mean	2.2	2.2	2.2	2.1	---	3.0	---	2.5	2.9
Difference	.2	.2	.2	.3	---	.1	---	.3	.1
% Variance	2.1^a	2.3^a	---	2.1^a	---	2.6^a	---	3.4^b	---
Negro Females									
Mean	2.6	2.6	2.6	2.2	---	2.9	---	3.2	3.3
Difference	.4	.4	.4	.6	---	.4	---	.3	.2
% Variance	---	2.8^a	3.1^a	2.8^a	---	2.7^a	---	---	---

Note.--Percentage of variance figures omitted where differences were not statistically significant. All figures omitted where N of underachievers not large enough for valid comparison.

[a] $p < .05$

[b] $p < .01$

[c] $p < .001$

the trend of means was the same as for significant comparisons, with underachievers performing below average achievers. One exception was in the business course area GPA, where the mean performance of low IQ underachievers was equal to that of average achievers. In the white male and white female samples, underachievers obtained significantly lower GPA's than average and overachievers in all elective course areas. Similar trends were found in the Negro male and Negro female samples; however, all differences were not significant.[23]

Because some courses were elective or corresponded to a curriculum, it was possible that choice of courses was related to SES level, IQ level, race, or sex. For example, a higher percentage of high SES level or high IQ level students would be expected to elect the academic curriculum in preparation for college, and, consequently, a lower percentage may have taken business or vocational courses. It would add to the interpretation of differences found in the performance of underachievers in specific groups if they also showed a different pattern of course selection than average and overachievers. To obtain an estimate of course area preference, the percentage of subjects in each achievement group who elected to take courses in the areas of business, vocational, foreign languages, music, and art was calculated. These figures are presented in Table 13.[24] The percentage of subjects taking particular courses does not reflect only the differential selection of course areas by subjects in school. It was also possible that a number of dropouts or transfers avoided taking courses in some areas up to the grade of withdrawal. This possibility was particularly suggested by the finding that only 89% of the combined sample had a science grade point average, although two units of science were required for graduation. In the other three areas where subgroups differed in selection of courses, 54% of the combined samples took business courses, 39% took foreign language courses, and 93% took art courses.

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[23] Only one Negro male underachiever and one Negro female underachiever took a foreign language course, and only one Negro male underachiever took a business course. Although these single individuals performed as well or better than average achievers, a valid comparison of the performance with the other groups could not be made.

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[24] The base N used to calculate these percentages was the total number of subjects in each group for whom secondary school grade point averages were available, i.e., the number of subjects with GPA's in the required course areas. This excluded from comparisons subjects whose secondary school grades were missing in their records and subjects who transferred out of the school system between the 6th and 7th grades. The percentage of subjects taking courses in English, social studies, and mathematics was 100% by virtue of the fact that this number of subjects was used as the basis for the calculations. These courses are omitted from the Table. Ninety-nine percent of the subjects took physical education, vocational, and music courses, and there were no differences of note across any of the subgroups compared. Therefore, these course areas have also been eliminated from the Table. To further simplify the presentation of figures in Table 13, the percentages for achievement groups have been omitted if the difference among achievement groups was not greater than 2%.

Table 13

Percentage of Groups With Course Area GPA's in Science, Business, Foreign Languages, and Art

Group	Science	Business	Foreign Language	Art
Combined Samples (N=3307)	89	54	39	93
High SES (N=1372)	88	54	56	93
Underachievers (N=178)	--	50	44	94
Average Achievers (N=934)	--	55	57	93
Overachievers (N=260)	--	52	60	90
Low SES (N=1852)	90	55	27	94
Underachievers (N=302)	--	53	21	--
Average Achievers (N=1314)	--	56	27	--
Overachievers (N=236)	--	53	35	--
High IQ (N=1959)	91	59	54	92
Underachievers (N=295)	--	60	40	96
Average Achievers (N=1364)	--	61	55	92
Overachievers (N=300)	--	52	62	90
Low IQ (N=1348)	86	46	18	95
Underachievers (N=195)	81	40	14	93
Average Achievers (N=945)	86	46	16	96
Overachievers (N=208)	87	51	28	95
White Males (N=1468)	87	43	46	92
Underachievers (N=224)	84	40	35	94
Average Achievers (N=1007)	88	43	47	93
Overachievers (N=237)	88	46	53	89
White Females (N=1450)	90	72	38	93
Underachievers (N=224)	--	69	28	93
Average Achievers (N=1013)	--	74	39	92
Overachievers (N=213)	--	65	94	48

(continued)

Table 13 (continued)

Group	Science	Business	Foreign Language	Art
Negro Males (N=214)	90	18	14	99
Underachievers (N=24)	88	4[a]	4[a]	96
Average Achievers (N=157)	90	17	14	99
Overachievers (N=33)	91	30	24	100
Negro Females (N=175)	94	42	17	98
Underachievers (N=18)	100	22	6[a]	--
Average Achievers (N=132)	95	48	14	--
Overachievers (N=25)	88	20	36	--

Note.--Percentages based on number of subjects with GPA's in English, Social Studies, and Mathematics course areas.

[a] Percentage represents one subject.

The percentage of subjects in the high SES and low SES levels who took science, business, and art courses did not differ greatly. There was considerable difference, however, in the area of foreign languages; 56% of high SES subjects compared to 27% of low SES subjects took one or more foreign language courses. Comparison of the course selection of high IQ level and low IQ level subjects showed a higher percentage of high IQ level subjects than low IQ level subjects electing business and foreign language courses, and a higher percentage of low IQ level subjects than high IQ level subjects electing art courses. A higher percentage of low IQ level subjects also avoided taking a course in the science area.

Comparison of the percentage of subjects electing courses in different areas in the race and sex samples revealed three distinctive differences. First, a higher percentage of girls than boys elected courses in the business area. Second, the avoidance of science courses was greatest in the white male samples. Third, a much lower percentage of subjects in the Negro samples took courses in foreign languages than did subjects in white samples.

Comparison of the reading achievement groups in the selection or avoidance of particular course areas showed several different patterns. A much lower percentage of underachievers than average or overachievers elected courses in the foreign language area in all samples and stratifications. The most marked difference was in the white female sample, where only 28% of the underachievers had a foreign language grade point average compared to 94% of the white female overachievers. There was a very strong relationship of reading achievement and IQ level to the selection of foreign language courses. High IQ overachievers most often took courses in this area (62%), and low IQ underachievers least often took them (14%). The percentages in other achievement groups were in direct relationship to reading achievement level within IQ level. This same pattern was also found across achievement groups within SES stratifications.

The selection of business courses by achievement groups in the high and low IQ levels was different from that found for foreign languages. In the low IQ level, more overachievers selected business courses (51%) than average or underachievers (40%). In the high IQ level, the opposite trend appeared; fewer overachievers (52%) selected business courses than average (61%) or underachievers (60%). In both high and low SES stratifications the highest percentage of subjects electing business courses were average achievers.

In the high IQ level, a higher percentage of underachievers selected art courses than did average or overachievers. In contrast, fewer underachievers in the low IQ level selected art courses.

An additional characteristic of low IQ underachievers was that this group had a lower percentage of GPA's than average and overachievers in all four course areas shown in Table 13. This suggested that many low IQ underachievers, rather than selecting some course areas over others, avoided taking any course that was not required. Although the number of courses that entered into a GPA was not calculated, the lower percentage figures in the low IQ level, particularly for low IQ underachievers, also suggested that these groups did not sample as wide a range of course areas as their high IQ counterparts and, for those students who remained in school, there must have been a higher concentration of courses within one particular area.

To a lesser degree, the more limited range of courses also characterized underachievers in other groups. With the exception of the high IQ level, an overrepresentation of underachievers appeared in only one of the four course areas, art. High IQ underachievers, in addition to showing an overrepresentation in selection of art courses, had as high a percentage as average achievers in the business area.

Comparison of the difference in GPA of under- and average achievers and the percentage of variance accounted for across the three achievement groups (Table 12) with the patterns of course selection, showed the following relationships:

1. In the area of science and business, where a lower percentage of underachievers took courses, the mean performance

of underachievers was closer to that of average achievers. For example, the mean performance of low IQ underachievers was only .1 grade scores below average achievers in the science area, compared to .2 grade scores in other required course areas. The better performance of underachievers in these areas resulted from negative selection, and, since it is possible that underachievers who avoided these courses were on the bottom of the achievement continuum, there is not definite information about compensative skills of underachievers in reading.

2. In the area of art courses and, for high IQ underachievers, business courses, there was evidence of positive selection. In these areas a higher percentage of underachievers took courses than average or overachievers, and their mean performance was closer to that of other achievement groups.

3. In the area of foreign languages, negative selection by underachievers was the greatest. Only 30% (combined samples) took courses in this area, and most of these subjects were in the high IQ or high SES levels. The strong relationship of underachievement in reading to performance in foreign languages was evident in that the mean performance of the small number of underachievers who elected these courses was lower than the performance of underachievers in any other area.

Standardized Test Performance. The 6th grade CAT Language and Arithmetic subtests and the 7th grade SAT Language and Arithmetic subtests were administered with the reading subtests covered in a previous section of this report. When achievement groups in the combined samples were compared on these tests (Part I), the performance of underachievers was significantly lower than that of average achievers and below normative grade placement on all subtests. Underachievers showed a greater deficit on the language subtests than on the arithmetic subtests.

The mean performance of achievement groups in the race-by-sex samples and IQ and SES stratifications on the 6th and 7th grade language test are presented in Table 14. Comparable data for the two arithmetic tests are presented in Table 15. In both language and arithmetic test performance in the 6th grade, differences among achievement groups were significant ($p < .001$) in all comparisons, with underachievers showing the lowest level of performance. Achievement groups also differed significantly in performance on the 7th SAT Language and Arithmetic subtests in all comparisons except in the Negro female sample. The trend of means, however, was the same in the Negro female sample, with underachievers performing at a lower level than average achievers.

The gain in language placement from grade 6 to grade 7 was only .2 grade units in the combined samples. This was considerably less than expected, even considering differences in the content and normative samples of the two tests. An additional factor that could affect language test performance would be a de-emphasis on the development of language skills in the 6th or 7th

Table 14

Mean Language Test Performance and Gain From Grades 6 to 7 of Under-, Average, and Overachievers

Group		Under-achievers	Average achievers	Over-achievers	F	omega^2
Combined Samples	6th CAT	5.51	6.07	6.50	128.46[b]	6.62
	7th SAT	5.20	6.25	7.19	77.90[b]	4.85
	Gain	- .31	.18	.69		
High SES	6th CAT	5.75	6.41	6.71	63.52[b]	7.85
	7th SAT	5.70	7.11	7.87	40.50[b]	5.73
	Gain	- .05	.70	1.16		
Low SES	6th CAT	5.39	5.84	6.22	46.95[b]	4.53
	7th SAT	4.94	5.64	6.46	28.20[b]	3.17
	Gain	- .45	- .20	.24		
High IQ	6th CAT	6.10	6.60	7.03	129.28[b]	10.78
	7th SAT	5.99	7.34	8.46	97.48[b]	9.34
	Gain	- .11	.74	1.43		
Low IQ	6th CAT	4.68	5.29	5.74	87.19[b]	10.50
	7th SAT	3.79	4.50	5.22	29.21[b]	4.69
	Gain	- .89	- .79	- .52		
White Males	6th CAT	5.32	5.91	6.33	65.80[b]	7.48
	7th SAT	4.79	5.91	6.71	35.49[b]	4.88
	Gain	- .53	.00	.38		
White Females	6th CAT	5.89	6.45	6.86	69.68[b]	8.05
	7th SAT	5.78	6.94	8.16	54.13[b]	7.06
	Gain	- .11	.49	1.30		
Negro Males	6th CAT	4.59	4.96	5.69	15.97[b]	11.61
	7th SAT	3.63	4.03	4.70	3.69[a]	3.47
	Gain	- .96	- .93	- .99		
Negro Females	6th CAT	4.78	5.61	6.11	13.07[b]	11.06
	7th SAT	4.21	5.01	5.54	2.20	1.87
	Gain	- .57	- .60	- .57		

Note.--Gain expected for norm grade placement of tests: 1.10 (SAT modal-age norms) and .60 (SAT total-group norms).

[a] $p < .05$

[b] $p < .001$

Table 15

Mean Arithmetic Test Performance and Gain From Grades 6 to 7 of Under-, Average, and Overachievers

Group		Under-achievers	Average achievers	Over-achievers	F	omega^2
Combined Samples	6th CAT	5.69	6.04	6.36	85.96[b]	4.49
	7th SAT	6.18	6.60	6.97	41.68[b]	2.56
	Gain	.49	.56	.61		
High SES	6th CAT	5.89	6.34	6.50	38.85[b]	4.89
	7th SAT	6.52	7.11	7.31	19.32[b]	2.73
	Gain	.63	.77	.81		
Low SES	6th CAT	5.59	5.85	6.17	32.26[b]	3.11
	7th SAT	5.99	6.26	6.60	15.36[b]	1.64
	Gain	.40	.41	.43		
High IQ	6th CAT	6.13	6.47	6.76	83.95[b]	7.20
	7th SAT	6.67	7.23	7.67	55.54[b]	5.50
	Gain	.54	.76	.91		
Low IQ	6th CAT	5.04	5.42	5.76	53.59[b]	6.65
	7th SAT	5.41	5.62	5.93	12.89[b]	1.90
	Gain	.37	.20	.17		
White Males	6th CAT	5.67	6.08	6.35	41.77[b]	4.83
	7th SAT	6.14	6.70	7.04	24.16[b]	3.20
	Gain	.47	.62	.69		
White Females	6th CAT	5.88	6.22	6.50	41.16[b]	4.83
	7th SAT	6.40	6.81	7.18	21.93[b]	2.91
	Gain	.52	.59	.68		
Negro Males	6th CAT	4.84	5.15	5.73	12.84[b]	9.34
	7th SAT	4.94	5.14	5.72	4.42[a]	3.82
	Gain	.10	- .01	- .01		
Negro Females	6th CAT	4.77	5.41	5.91	10.96[b]	9.31
	7th SAT	4.95	5.43	5.50	1.44	.65
	Gain	.18	.02	- .41		

Note.--Gain expected for norm grade placement of tests: 1.10 (SAT modal-age norms) and .60 (SAT total-group norms).

[a] $p < .05$

[b] $p < .001$

grade curriculum. It should be emphasized, however, that regardless of causes for the small gain, assessment of the relative performance of achievement groups remains valid in that all groups were subject to the same conditions. In addition to remaining significantly below average achievers, underachievers in all samples and stratifications showed a loss in language grade placement from grade 6 to grade 7. A loss rather than gain in language placement was also found in the low IQ level (all achievement groups) and in the Negro samples. The relationship of initial standing, i.e., mean performance in the 6th grade, to amount of gain was also clearly present. Across the six achievement groups in the high and low IQ levels (or in the SES levels), the rank order correlation of 6th grade performance level to gain was 1.00.

In 6th and 7th grade arithmetic test performance, there was also a relationship of gain to 6th grade score, however, not as consistent or strong a relationship as with the language test performance. Exceptions were in the low IQ level, where underachievers showed a greater gain than average achievers, and in the Negro male and Negro female samples, where average and overachievers showed loss or very little gain and underachievers showed a mean gain from grade 6 to 7.[25]

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[25] It should be emphasized again that the pattern of performance in the low IQ group does not solely reflect the pattern in the Negro male and Negro female samples. Examination of scores of low IQ level white males and white females showed the same pattern of performance, very little gain in all achievement groups and a slightly higher gain for underachievers than for average or overachievers.

The relationship of gain to initial standing in arithmetic and language test performance points to the same conclusion as reached in examining the reading test scores. Deficiencies in these areas compound over successive grades and result in an increased deficiency relative to grade placement for groups performing at low levels in the 6th grade.

When the performance of underachievers, average achievers, and overachievers in the combined samples was compared on the 9th grade ITED, it was found that underachievers in reading were performing significantly below average and overachievers on all subtests. The percentage of variance among achievement groups accounted for by the different subtests indicated that underachievers were the least different from average achievers on the subtests of Quantitative Thinking and Natural Sciences Background. The greatest differences between under- and average achievers occurred on the subtests of Vocabulary, Literary Materials, Social Studies Reading, and Natural Sciences Reading.

Comparison of achievement groups in the high and low SES levels and in the high and low IQ levels produced the same results. The mean performance of underachievers was significantly below that of average and overachievers in each of these stratifications ($p < .001$), and the percentage of variance accounted for across groups indicated that underachievers were most different from average achievers on the subtests most related to reading and were least different on the Natural Sciences Background and Quantitative Thinking subtests.

The mean performance (in standard scores) and the norm percentile rank of the mean for the achievement groups in the race-by-sex samples are presented in Table 16. On all subtests the mean percentile rank of underachievers was lower than that of average achievers except for Test 9 in the Negro male sample. Although there were not significant differences among the achievement groups on some other subtests in the Negro male and Negro female samples, trends were toward overachievers having the highest mean and underachievers having the lowest mean. The performance of female underachievers was generally higher than the male underachievers, as on other achievement measures. It is of note, however, that this was not true on all subtests. The mean percentile rank of male underachievers in both races was higher on the subtests of Basic Social Concepts and Quantitative Thinking than that of female underachievers. White male underachievers also had a higher mean percentile rank on Natural Science Background than white female underachievers and white female average achievers.

Grade Retention in Secondary School

Nonpromotion in secondary school can be considered as a gross measure of academic achievement in that it represents failure in a sufficient number of courses to require a student to repeat a grade. In the total sample, it was found that a significantly

Table 16

Mean Performance and Norm Percentile Rank of Under-, Average, and Overachievers in Reading in 9th Grade ITED

Test[a]	Underachievers		Average Achievers		Overachievers		F	omega^2
	M	Percentile Rank	M	Percentile Rank	M	Percentile Rank		
				WHITE MALE SAMPLE				
1	10.9	41	13.4	60	14.8	70	21.41[d]	3.54
2	13.0	57	15.2	71	16.3	77	13.10[d]	2.15
3	10.5	38	12.7	55	14.1	66	24.29[d]	3.99
4	13.0	68	14.8	78	16.5	84	14.46[d]	2.35
5	11.2	49	13.9	66	15.7	75	29.11[d]	4.79
6	10.4	47	13.0	64	14.3	71	18.86[d]	3.08
7	8.7	36	11.6	56	13.2	66	28.65[d]	4.70
8	10.9	45	13.7	63	15.5	73	32.83[d]	5.36
9	11.0	50	13.6	66	15.0	75	22.53[d]	3.72
				WHITE FEMALE SAMPLE				
1	10.3	36	12.2	51	14.4	67	28.37[d]	4.42
2	10.5	41	12.8	56	15.0	70	30.47[d]	4.79
3	13.3	60	14.9	71	16.9	83	26.05[d]	4.08
4	11.8	59	13.0	68	14.2	75	7.58[d]	1.11
5	11.8	53	13.8	66	16.0	77	31.01[d]	4.89
6	10.6	48	12.3	59	15.1	76	31.92[d]	5.00
7	10.5	48	13.1	65	15.4	78	36.74[d]	5.76
8	11.9	52	14.2	66	16.8	80	38.31[d]	5.99
9	12.2	58	14.2	70	16.9	83	31.84[d]	5.04
				NEGRO MALE SAMPLE				
1	7.1	18	7.3	19	8.7	26	1.55	0.71
2	4.8	10	7.2	22	9.0	32	5.88[c]	5.68
3	6.3	14	7.1	17	9.2	30	3.97[b]	3.51
4	6.6	23	6.9	24	6.5	22	0.13	0.00
5	5.2	5	7.5	20	8.9	32	7.88[d]	7.87
6	5.5	14	7.0	22	8.2	29	2.16	1.42
7	4.5	13	4.8	15	6.7	23	3.91[b]	3.56
8	4.4	8	6.5	16	8.2	26	5.98[c]	5.90
9	6.4	19	6.3	18	6.7	21	0.11	0.00

(continued)

Table 16 (continued)

Test[a]	Underachievers		Average Achievers		Overachievers		F	omega^2
	M	Percentile Rank	M	Percentile Rank	M	Percentile Rank		
				NEGRO FEMALE SAMPLE				
1	6.1	13	7.3	19	8.9	27	2.71	2.35
2	4.9	10	7.0	21	6.6	19	2.10	1.50
3	8.0	23	9.9	34	12.7	55	5.88[c]	6.31
4	4.4	14	6.5	22	6.6	23	2.20	1.66
5	7.7	22	8.4	28	11.5	51	6.53[d]	7.23
6	5.6	14	6.8	20	8.1	28	1.46	0.65
7	4.5	13	6.8	24	9.8	44	8.42[d]	9.41
8	7.4	21	7.6	22	10.1	39	4.06[b]	4.22
9	6.8	22	7.9	29	10.9	49	5.82[c]	6.53

Note.--Means are expressed in standard scores. Ns and standard deviations are presented in the Appendix.

[a] Test 1: Understanding of Basic Social Concepts
Test 2: General Background in the Natural Sciences
Test 3: Correctness and Appropriateness of Expression
Test 4: Ability to Do Quantitative Thinking
Test 5: Ability to Interpret Reading Materials in the Social Studies
Test 6: Ability to Interpret Reading Materials in the Natural Sciences
Test 7: Ability to Interpret Literary Materials
Test 8: General Vocabulary
Test 9: Use of Sources of Information

[b] $p < .05$

[c] $p < .01$

[d] $p < .001$

larger percentage of underachievers than average or overachievers were retained in secondary school grades (Part I).

Comparison of the achievement groups in the high and low SES and IQ stratifications showed the same relationships that were found in the combined samples, and as characteristic of other achievement measures, there was a strong relationship of both IQ level and SES level to retention in secondary school. For low IQ level students, the incidence of retention was more than 20% above that among high IQ level students (Table 17). The relationship of reading achievement to retention was greater in the low IQ and SES stratifications than in the high stratifications. In the low IQ level, 41% of the underachievers were retained in a secondary school grade, 10% more than average achievers and 20% more than overachievers. Among high IQ underachievers the retention rate was less than that for low IQ overachievers but significantly greater than that for high IQ average and overachievers. The same pattern was found in the high and low SES levels; however, differences across achievement groups were not as great as in the IQ stratifications.

In the white male and white female samples a significantly greater percentage of underachievers were retained than average and overachievers. In the Negro samples, a higher percentage of underachievers were retained; however, the differences among groups were not statistically significant. More males of both

Table 17

Percentage of Under-, Average, and Overachievers
Retained in Grades 7 Through 12

		Under-achievers	Average achievers	Over-achievers	X^2
Combined Samples	N	118	412	62	24.35[c]
	%	23.4	17.3	11.7	
High SES	N	28	90	20	8.08[a]
	%	15.2	9.4	7.4	
Low SES	N	87	301	39	12.08[b]
	%	28.3	22.2	15.9	
High IQ	N	36	124	19	6.63[a]
	%	11.8	8.7	6.0	
Low IQ	N	82	288	43	20.58[c]
	%	40.8	30.3	20.3	
White Males	N	72	238	37	17.53[c]
	%	31.2	22.9	15.0	
White Females	N	34	106	14	9.07[a]
	%	14.9	10.2	6.4	
Negro Males	N	8	48	7	1.28
	%	29.6	29.3	20.0	
Negro Females	N	4	20	4	.56
	%	21.0	14.5	16.0	

[a] $p < .05$

[b] $p < .01$

[c] $p < .001$

races were retained than females, and similar to the difference between sexes in grade point averages, the percentage of male overachievers retained in grade was the same as the percentage of female underachievers who were retained.

Measures of Later Behavior and Outcome

In Part I, achievement groups in the combined samples were compared on mean days absent in secondary school grades, the number of school activities in which a student participated in grades 7 to 10, and on high school dropout rate. High school graduates were also compared on attendance in school, college, or university vs. employment a year following graduation. Findings indicated that the three achievement groups differed very little in the mean number of days absent, and differences were not statistically significant in any secondary school grade. A higher percentage of underachievers than average or overachievers were found to have no participation in school activities indicated on their secondary school records; however, only the difference in the 7th grade was statistically significant. It was also found that a significantly greater percentage of underachievers became high school dropouts, and significantly fewer underachievers who graduated from high school continued their education in technical school, college, or university.

Absence. Achievement groups in the four race-by-sex samples did not differ significantly in number of days absent in any secondary school grade. On the basis of these negative findings, comparisons were not made in the SES and IQ groups.

Participation in School Activities. Comparison of achievement groups on the number of school activities in grades 7 through 10 showed a general trend in SES and IQ groups and race-by-sex samples, suggesting that underachievers in reading had no participation in school activities more often than average and overachievers. Very few of the differences between achievement groups, however, were statistically significant, and, where significant differences did appear, they were not consistently in a particular grade. There was some indication that lack of participation in activities was more characteristic of underachievers in the high IQ level (Table 18). The difference between high IQ level under-, average, and overachievers was significant in the 7th grade ($p < .01$), 9th grade ($p < .05$), and approached significance in the 10th grade ($p < .10$).

One exception to the trend of greater participation of average and overachievers was in the Negro male sample, where a significantly greater number of overachievers did not participate in school activities in grade 10 (Table 19). The general trends in the data and significant differences among high IQ groups suggest that the effects of underachievement in reading on later participation in school activities may merit further investigation. Since these findings were based on a purely quantitative count of activities and did not take into account the type of activities that students

Table 18

Percentage of Under-, Average, and Overachievers in High and Low SES and IQ Levels With No Participation in School Activities Indicated on Secondary School Records

	Grade	Under-achievers	Average achievers	Over-achievers	Significance level of X^2
High SES	7	36.0	29.7	27.9	
	8	30.5	29.5	25.2	
	9	34.5	30.9	29.8	
	10	44.5	44.4	43.7	
Low SES	7	35.4	31.2	29.7	
	8	35.2	32.2	31.4	
	9	39.8	35.2	31.3	
	10	52.0	46.0	48.9	
High IQ	7	36.5	27.7	26.4	$p < .01$
	8	31.9	29.5	28.9	
	9	36.9	30.2	26.0	$p < .05$
	10	49.0	41.4	41.3	$p < .10$
Low IQ	7	35.9	35.3	31.5	
	8	35.5	33.8	28.5	
	9	39.6	38.5	36.4	
	10	59.5	53.8	56.1	

Note.--Chi square based on 2 x 3 table of achievement groups and participation vs. no participation frequencies.

Table 19

Percentage of Under-, Average, and Overachievers in Race-by-Sex Samples With No Participation in School Activities Indicated on Secondary School Records

	Grade	Under-achievers	Average achievers	Over-achievers	Significance level of X^2
White Males	7	41.5	34.3	29.2	$p < .05$
	8	37.9	33.5	30.6	
	9	35.8	38.5	37.4	
	10	58.3	53.9	52.3	
White Females	7	35.6	34.0	32.7	
	8	31.0	35.1	29.1	
	9	41.2	35.1	27.0	$p < .001$
	10	49.2	43.9	47.1	
Negro Males	7	16.0	7.6	8.6	
	8	16.7	5.6	21.9	$p < .01$
	9	23.5	9.7	6.7	
	10	23.1	22.5	20.0	
Negro Females	7	6.2	7.1	12.5	
	8	28.6	14.1	17.4	
	9	33.3	8.8	12.5	$p < .05$
	10	50.0	20.8	21.4	

Note.--Chi square based on 2 x 3 table of achievement groups and participation vs. no participation frequencies.

participated in, some differences between achievement groups may have been obscured. The finding of a strong relationship between the 6th grade IQ score with later achievement and the greater relationship of underachievement to participation in activities among high IQ students suggested that more high IQ underachievers had a recognition of their potential to succeed academically and perhaps more motivation to achieve. Participation in extracurricular activities by these students may have been sacrificed more often than by others in order to devote the added time to studies necessitated by their poor reading skills.

Dropout or Graduation. In the total sample, 38% of the subjects transferred out of the school system between grades 7 and 12, with resulting loss of information on their eventual dropout or graduation from high school. Of the remaining 2,843 subjects, 73% were known to have graduated from high school, and 27% were known to have dropped out prior to completing the 12th grade. There was a significant difference ($p < .001$) in the dropout rate of the three achievement groups in the combined samples; 32% of the underachievers left school prior to graduation compared to 27% of the average achievers and 20% of overachievers. Although this indicated a definite relationship between underachievement in reading in elementary school and later graduation from high school, the difference in the dropout rate across achievement groups was small and only accounted for 0.5% of the variance across groups.

Comparisons were made among the achievement groups in high and low SES and IQ stratifications and the race-by-sex samples to determine whether the relationship of underachievement in reading to high school dropout differed in these groups. These data are presented in Table 20.

A strong relationship between SES level and high school graduation was found. Among high SES students, 86% were graduates, compared to only 67% of low SES students. The relationship between IQ level and dropout was even stronger. In the high IQ group, 87% of the subjects graduated, compared to only 56% of the low IQ subjects. In both high and low SES and IQ levels, a lower percentage of underachievers than average or overachievers graduated; however, the difference among achievement groups was only significant in the low IQ level ($p < .001$).

Although consistent trends in all groups indicated there was a relationship of reading achievement to high school dropout that was independent of SES and IQ level, the effect was significant only in combination with lower IQ performance. Underachievement in the high IQ or SES levels was clearly associated with lower achievement but indicated only a slightly higher probability of not completing high school. The findings also indicated that IQ and SES level were more powerful predictors of high school dropout or graduation than the reading achievement classification alone. In the low IQ level, where the differences among achievement groups were the greatest, the dropout rate of underachievers was almost 10% more than that of average achievers. In comparison, the difference in dropout rate between high

Table 20

Percentage of High School Graduates Among Under-,Average, and Overachievers in Combined Samples, High and Low SES and IQ Level, and Race and Sex Samples

		Under-achievers	Average achievers	Over-achievers	F
Combined Samples	N	287	1456	335	7.73^c
(N=2843)	%	67.8	72.8	79.8	
High SES	N	120	655	184	1.68
(N=1120)	%	82.2	85.3	89.3	
Low SES	N	167	791	149	2.53
(N=1651)	%	62.5	67.1	72.7	
High IQ	N	212	1001	219	1.46
(N=1653)	%	83.8	86.7	89.4	
Low IQ	N	78	468	120	9.02^c
(N=1190)	%	45.9	55.4	68.6	
White Males	N	123	606	157	4.72^b
(N=1244)	%	64.6	71.1	79.0	
White Females	N	148	694	149	3.22^a
(N=1234)	%	77.3	80.6	87.9	
Negro Males	N	10	83	19	.82
(N=201)	%	45.5	55.7	63.3	
Negro Females	N	6	73	10	1.11
(N=154)	%	40.0	60.7	58.8	

Note.--Mean differences on a dichotomous group membership variable used to test significance of differences. Transfers out of school system not included in comparisons.

[a] $p < .05$
[b] $p < .01$
[c] $p < .001$

and low SES average achievers was 18%, and between high and low IQ average achievers was 31%![26]

There was a lower percentage of graduates among underachievers in each of the race-by-sex groups; however, differences were only significant in the white male and white female samples. In agreement with the above findings, significant differences resulted largely from the greater dropout rate among low IQ level subjects. The dropout rate was much higher in the Negro samples than in the white samples and was higher for males than for females in both races. In both Negro samples, less than half of the underachievers graduated from high school; however, the percentage of graduates among average achievers was also low, 56% for Negro males and 61% for Negro females.[27]

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[26] In a previous study (Lloyd, 1967), it was found that socioeconomic measures and achievement measures independently predict dropout or graduation from high school in this population; so, the difference between high and low IQ levels in dropout rate does not account for all the difference between high and low SES levels.

[27] The similarity between the figures for the Negro male sample and the low IQ stratification may be noted. It is important to emphasize again that although the majority of subjects in the Negro samples fell into the low IQ stratification (78%), these subjects constituted only 24% of the low IQ group. Data for white students in the low IQ range were similar to those of the Negro samples. Among low IQ white males, 43% of the underachievers, 49.4% of the average achievers, and 66.3% of the overachievers graduated. Among low IQ white females, 54.7% of the underachievers, 65.6% of the average achievers, and 80.4% of the overachievers graduated.

Work or Further Training After Graduation. Follow-up information from counselor records in the year following graduation was available for 1,129 of the high school graduates (54% of the total number of graduates). In the combined samples, it was found that 69% of the graduates on whom information was available were attending a school, college, or university in the year following graduation (average achievers). In contrast, only 57% of the underachievers were found to be continuing educational training; a significantly lower percentage than for average achievers ($p < .001$).

Data from the follow-up information for achievement groups in the SES and IQ stratifications and in race-by-sex samples is presented in Table 21. As would be expected, continuation of training after high school graduation was associated with high SES and high IQ levels. Eighty-three percent of the high SES graduates and 77% of high IQ graduates continued educational training. The difference between graduates in the high and low SES levels and high and low IQ levels who continued educational training was 26%.

Fewer underachievers, than average or overachievers, continued their education beyond high school in all groups. Differences across achievement groups were significant, however, only in the high SES, high IQ, and white female groups. In the high SES level, 18% fewer underachievers than average achievers continued their education.

Table 21

Follow-up Information on Graduate Under-, Average, and Overachievers

	Under-achievers		Average achievers		Over-achievers		X^2
	N	%	N	%	N	%	
			HIGH SES				
School	42	62.7	355	81.0	124	89.2	18.77[b]
Work	22	32.8	75	17.1	13	9.4	
			LOW SES				
School	36	52.9	193	54.8	30	53.6	0.20
Work	30	44.1	144	40.9	24	42.9	
			HIGH IQ				
School	66	61.1	477	74.9	125	84.5	15.71[b]
Work	36	33.3	146	22.9	20	13.5	
			LOW IQ				
School	12	41.4	73	45.9	30	62.5	4.41
Work	17	58.6	76	47.8	17	35.4	
			WHITE MALE SAMPLE				
School	37	64.9	264	79.3	79	83.2	5.64
Work	18	31.6	67	20.1	16	16.8	
			WHITE FEMALE SAMPLE				
School	38	53.5	256	65.8	69	79.3	10.71[a]
Work	29	40.8	114	29.3	16	18.4	

(continued)

Table 21 (continued)

	Under-achievers		Average achievers		Over-achievers		X^2
	N	%	N	%	N	%	
			NEGRO MALE SAMPLE				
School	2	28.6	15	32.6	4	44.4	0.48
Work	5	71.4	29	63.0	5	55.6	
			NEGRO FEMALE SAMPLE				
School	1	50.0	15	53.6	3	60.0	2.28
Work	1	50.0	12	42.9	0	0.0	

Note.--Schools include attendance at university, college, business or vocational school. Subjects who were neither attending school nor employed not included in table. They constitute the difference between the sum of percentages and 100% in each group. Over-all 4% of underachievers, 3% of average achievers, and 2% of overachievers were neither working nor attending school.

[a] $p < .01$

[b] $p < .001$

In the high IQ level, 14% fewer underachievers than average achievers continued education or training.[28]

SES level was more predictive of work or training following graduation than IQ level, in contrast to findings related to level of achievement in school. This can be seen in the range of percentages across the six achievement groups from low to high. In the SES stratification there was no overlap between achievement groups in the high and low levels. A higher percentage of high SES underachievers (62.7%) continued training than did low SES overachievers (53.6%). In the IQ stratification, slightly more low IQ overachievers continued training (62.5%) than did high IQ underachievers (61.1%).

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[28] Differences in the completeness of follow-up information in the different groups must be considered in evaluating the differences among groups. In the white male, white female, and Negro male samples, the percentage of graduates with follow-up information was approximately the same as that for the combined samples (54%). In the Negro female sample, 39% had follow-up information. A much higher percentage of subjects in the high SES and high IQ groups had follow-up information than in the comparable low groups. Information was available on 67% of the high SES graduates, compared to 43% in the low SES level, and 62% in the high IQ level compared to 35% in the low IQ level. Although there was no way to test whether follow-up was more complete for subjects in training than in the work force, the data sources suggested that information on training was more likely to have been obtained. Location of subjects attending school was facilitated by the availability of school enrollment lists, whereas subjects in the work force had to be located through mail questionnaires. Therefore, the percentage of subjects continuing their training was probably more reliable than that for subjects in the work force.

In most cases, follow-up information was also more complete for average and overachievers than for underachievers. In the two groups, where the percentage of follow-up information for underachievers was greater (the low IQ level and the Negro male sample), more than half of the graduates in these underachievement groups were employed rather than continuing educational training. This suggested that the relationship of underachievement to work rather than continued training may be stronger than indicated in our data. In this regard, the higher high school dropout rate of underachievers also must be considered. The majority of underachievers who did not complete high school would also be expected to enter the work force rather than continue training.

Discussion and Summary

The purpose of dividing the sample into subgroups based on the major variables of IQ, SES, race, and sex was to determine whether the effects of underachievement in reading were modified in groups differing in these characteristics. Differences that were found were small and were generally overshadowed by the consistent pattern reflected in all groups, i.e., that underachievers in the 6th grade performed at a lower level than average achievers on standardized tests, course marks, and other measures of achievement all through secondary school.

Although the primary focus was on the problems of underachievers within the different groups, secondary findings on the relationships of IQ level and SES level to achievement also merit discussion. First, both 6th grade IQ score and SES level were highly predictive of later performance in high school, graduation from high school, and training after graduation. High IQ average achievers placed one or more years higher on standardized tests than low IQ average achievers and received course marks that averaged one or more letter grades higher. The percentage of high IQ average achievers graduating from high school was 30% higher, and among graduates, 30% more continued their training after high school than low IQ average achievers.

The relationship of SES level to school achievement was similar to that of IQ; however, differences in performance of high and low groups were not as great. Thus, IQ score was a better predictor of later achievement than SES level. In one comparison, high and low SES groups were more widely separated than high and low IQ groups. This was in the percentage of high school graduates who continued training (college, business, or vocational school) after graduation. Parents' educational and occupational level were therefore better predictors of the child's educational and occupational level beyond high school than the test of general mental ability when the range of achievement was restricted to those who successfully completed high school. In connection with this finding, it should be remembered that the follow-up measure indicated entry into school or occupation and was not a measure of educational or occupational success.

The design of the study was not set up to investigate the combined effects of SES and IQ level on achievement. On the one hand, a similar pattern of relationship of the SES and IQ to achievement would suggest considerable overlap in the relationship of IQ and SES to achievement. On the other hand, independent effects were suggested by the moderately low correlation between IQ and SES,

.33, compared to higher correlations of these measures with achievement. Evidence to support a combined effect of SES and IQ in relationship to reading achievement was the finding that a higher percentage of underachievers came from low SES than from high SES background; whereas, in high and low IQ levels, the percentage of underachievers was the same. Further support that SES and IQ level have a combined effect on achievement level comes from Curry (1962), who compared three socio-economic status groups within each of three general ability levels. Trends from high to low on three achievement tests were found across IQ within SES level and across SES within IQ level. As in our data, the IQ score was a greater predictor of achievement than was SES level. In addition, the mean achievement scores of the nine groups were perfectly rank-ordered from high to low. The highest mean was in the high-IQ, high-SES group; the lowest was in the low-IQ, low-SES group.[29]

Considering the performance of under-, average, and over-achievers in reading across high and low IQ and SES stratifications, a consistent pattern was found in relationship to all later measures of achievement: (1) Underachievers performed below average achievers

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[29] The greater separation of reading achievement groups when stratified on IQ as opposed to SES in the present study would also support Curry's conclusion that high intelligence will compensate for poor SES background more than high SES will compensate for low IQ in school achievement.

within the same level. (2) All high IQ level groups performed above all low IQ level groups, and all high SES level groups, except for underachievers, performed above all low SES level groups.
(3) Differences in performance of under-, average, and overachievers were greater in high IQ and SES levels than in the low IQ and SES levels. Although there was a general decrease in the separation of groups across years, the general pattern held up consistently over replicated measures through all secondary school grades.[30] The implication of this pattern is that achievement in reading has relationship to later performance that is independent of IQ and SES. Since each predicted achievement independently, the combined information of IQ level and relative achievement in reading would increase the prediction of later performance over that obtained by either alone.

The performance of achievement groups over successive years showed an additional characteristic that was related to reading achievement and IQ level. This can be best described as a relationship of initial achievement level to gain. This relationship was found in comparisons of high and low IQ level groups on standardized tests. At one extreme, low-IQ underachievers, whose grade placement on 6th grade tests was the lowest of the six achievement groups, showed a gain in test scores to the 7th and 9th grade that was not equal to the grade difference between tests. This resulted in a greater deficit relative to grade placement in subsequent years. At the other extreme, high IQ overachievers, with the highest 6th grade level, showed gain equal to or greater than that expected from the grade placement of tests.

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[30] The longitudinal methodology, with the attrition of subjects over years, would account for some of the decrease between groups in performance level across years.

The results indicate that in order to identify the underachiever, understand his achievement problems, and evaluate his progress in remedial programs, it is necessary to consider not only his relative reading level, but also the influence on achievement of general level of mental ability and SES background. The relationship of initial achievement level to gain also supports the philosophy of early intervention in remedying reading problems, for the evidence pointed to a combined effect of low general achievement and underachievement in reading that results in the underachievers' falling farther and farther behind his peers in each successive year.

High IQ Underachievers. Underachievers with IQ scores of 100 or above have received the most attention in previous studies. The concern has been that these students do not perform at a level commensurate with their potential. Results of this study support this concern in that high IQ underachievers were found to be performing farther below their potential than low IQ underachievers (using the performance of average achievers as a criterion of potential). On the other hand, although there was a loss in potential level of achievement, the performance of high IQ underachievers was largely within the average range.

On tested reading achievement, high IQ underachievers performed .8, .5, and .3 grades below the norm in grades 6, 7, and 9, compared to the performance of average achievers which was close to .6 grades above the norm in all three years. Underachievers performed at grade level on tests of arithmetic and language skills in the 6th grade; however, their performance fell below grade placement in grade 7.

The mean grade point average over secondary school grades was within the range of the letter grade of "C." The mean marks of average achievers ranged from C+ to B over these years. Of the high IQ average achievers, 55% took foreign language courses, a requirement in the academic curriculum. In contrast, only 40% of the high IQ underachievers took foreign language courses, and their mean performance in this area was lower than in any other. Underachievers did not receive higher grade point averages in the area of science or mathematics than average achievers, although they were not outperformed as much by average achievers in these areas.

There were two indications of adjustments that high IQ underachievers made that could reflect difficulties in keeping up with required coursework in secondary school. The first was that a higher percentage took elective art courses than did average or overachievers. The second was that a significantly higher percentage had no indication on their records of participation in school activities (clubs, sports, committees, etc.).

A significantly higher percentage of high IQ underachievers were retained in a secondary school grade than average achievers; however, this percentage was less than in any of the low IQ achievement groups. The dropout rate was higher than for average achievers, but not significantly different. Although the majority of high IQ underachievers graduated from high school (84%), a significantly lower percentage of the graduates continued training (61%) than average achievers (75%).

Low IQ Underachievers. The mean 6th grade IQ score of low IQ underachievers was 88. This low level of ability and general achievement in combination with the relatively lower level of reading skills was seen to severely handicap the performance of this group in secondary school. In the 6th and 7th grades, low IQ underachievers were reading 2.5 grades below grade placement. In the 9th grade, their reading level was 2.7 grades below placement. In all three grades,their performance was significantly below that of low IQ average achievers. What appears to be a fairly stable level of performance, low but improving proportionately, probably underestimates the severity of the reading problems in this group. The majority of low IQ underachievers dropped out of secondary school (56%), and reading level reflects only the performance of those subjects remaining in school to the 9th grade.

The performance level of low IQ underachievers was not as low in tested arithmetic and language achievement as it was in reading in the 6th grade. In these two areas, they performed 1.0 and 1.5 grades below placement. Test performance in the 7th grade, however, fell to 1.8 and 3.4 grades below placement in arithmetic and language, respectively. The mean test performance in the 9th grade was between the 20th and 30th percentiles on subtests of the ITED.

The grade point average received by low IQ underachievers was significantly below that of low IQ average achievers in all secondary school grades and varied around 2.3, a letter grade of D+ to C-. The performance of low IQ underachievers was low in all course areas. The mean performance approached a letter grade of "C" only in vocational, music, and art courses. Only 14% of this group took a foreign language course, and the mean course mark received was lower than a letter grade of "D" indicating that many failed. There was also some evidence that low IQ underachievers avoided taking courses that were not required in secondary school and more often restricted their choice of courses to one particular area.

Complete failure in coursework was reflected in the percentage of low IQ underachievers retained in secondary school grades (41%), compared to 30% for low IQ average achievers and an over-all rate of grade retention in secondary school of 17%. Of the 44% in this group who graduated from high school, less than half (41%) were pursuing additional training a year following graduation.

Since level of ability reflected in the IQ score appeared to be as much or more related to later achievement as relative level of reading achievement, the question can be raised as to whether remedial efforts to correct reading skills in elementary school would have enough effect to compensate for low level of general ability. A partial answer can be found in the performance of low IQ overachievers, whose mean 6th grade IQ score was comparable to that of the underachievers. The mean reading level of low IQ overachievers was .4 grades below placement in the 6th grade, and although there was a loss in subsequent grades relative to grade placement, the subjects were reading at the 8.5 level in the 9th grade compared to a reading level of 7.1 for underachievers. Course performance, reflected in grade point averages, was just slightly below average; only 20% were retained in a secondary school grade; and 69% successfully completed high school. Perhaps the most significant finding was that 62.5% of the low IQ overachievers who graduated continued training following graduation, as high a percentage as was found for high IQ underachievers.

Underachievers in High and Low SES Levels. The relationship of reading achievement in elementary school to secondary school performance when viewed in terms of high and low SES background was similar to that found for high and low IQ groups. The description of the performance of high IQ underachievers and low IQ underachievers relative to their peers also applies to high and low SES underachievers. There were only two findings that indicated an association of SES level to reading achievement that was different from that of IQ level, and these differences were slight. More underachievers came from low SES background (16%) than from high SES background (13%). Conversely, 20% of the high SES group were overachievers compared to 13% of the low SES group. Within the high and low IQ ranges, the percentages of underachievers and overachievers were approximately the same (15%). Socio-economic background also had a slightly higher relationship than IQ level to whether or not high school graduates pursued additional training, particularly overachievers. Almost all high SES overachievers continued training after high school graduation (89%). This was a higher percentage than among high IQ overachievers (85%). On the other hand, fewer low SES overachievers (54%) continued training than did low IQ overachievers (63%).

Sex Differences. The percentage of underachievers among males and females was approximately the same (15%); however, the over-all performance of male underachievers was lower than that for females. Female underachievers were reading .5 grades closer to the norm than male underachievers in the 6th grade and in secondary school grades. Scores on most other achievement tests were similarly higher than those of male underachievers.

Female underachievers did considerably better than male underachievers in coursework. In fact, grade point averages of female underachievers were often higher than those of male average achievers and, in some instances, equal to or higher than male overachievers. Comparison of the performance on standardized achievement tests with marks received for coursework strongly suggested that the school success of female underachievers resulted from differential evaluation of performance of boys and girls or from qualities other than achievement level possessed by girls and not by boys. For example, the average placement of white female underachievers on the 9th grade ITED was at the 51st percentile. White male underachievers placed at the 48th percentile, both significantly below average achievers of the same sex. The GPA for the 9th grade courses for female underachievers was 3.1 compared to a GPA of 2.6 for male underachievers. White male average achievers placed at the 64th percentile in test performance in the 9th grade, but obtained a grade point average of 2.9. White male overachievers placed at the 73rd percentile, but had a grade point average of only 3.2.

Although underachievers of both sexes performed significantly lower than average achievers of the same sex in all course areas, performance of male underachievers was closer to that of average and overachievers in vocational courses, and the performance of female underachievers was closer to that of average and overachievers in business courses.

A higher percentage of female underachievers graduated from high school (77%) than male underachievers (64%) or average achievers (71%); however, the opposite trend was found in the percentage of graduates who continued training after graduation. Sixty-five percent of the male underachievers continued training compared to 54% of the female underachievers and 66% of the female average achievers.

Race Differences. The Negro samples were more homogeneous in IQ and SES levels than the white samples. The mean IQ score in the Negro samples was 87, and the majority of Negro subjects came from the two lowest of five SES levels. If low general achievement and low SES have a combined effect upon achievement, as suggested, it would be expected that this effect would be greatest in the Negro samples. There were other differences between the white and Negro samples that could have affected the findings, and specific information on some of these factors was not known. Primary among these was the difference in the characteristics of the schools attended by the white and Negro students. The school system was segregated until 1954, when these students were in the 6th grade, and it was estimated from the school system integration report that the maximum number of Negro students in this cohort who might have attended previously all-white schools during secondary school grades was 1% (six subjects). Although specific differences in schools were not ascertained, it can be surmised from the findings of Coleman, et al. (1966) that the direction of difference was the same as that generally found, a lower quality of education received by Negro students than by white students. The high dropout rate among Negro students (57%), which may partly reflect school differences, also affected comparison of achievement groups in later grades because of the reduced number of subjects in the groups.

In spite of differences in level and other unmeasured influences on achievement in the Negro samples, the relationship of underachievement in reading to later performance was generally the same as in the white samples. Minor differences that were found appeared to be attributable to the factors above: lower level of initial achievement (6th grade), combined negative effects of low IQ and low SES, attrition of subjects through dropout.

Reading level of Negro underachievers was 2.8 grades below placement in the 6th grade. By the 9th grade the reading level of underachievers was approximately 4.0 grades below placement. Tested level of achievement was not as low in language and arithmetic in the 6th grade (1.1 to 1.5 grade equivalents below placement); however, underachievers showed a loss relative to grade placement in the 7th and 9th grades and performed significantly below average achievers on most test measures. Where differences were not significant, the same trend was found, with underachievers performing below average and overachievers. Although loss relative to grade placement through secondary school was greatest in Negro samples (all achievement groups), this pattern also characterized the performance of white males and white females who had IQ scores in the same range as the Negro samples.

The lack of significant differences on some measures would suggest that underachievers were not as handicapped by poor reading skills in the Negro samples, but it also has to be considered that the smaller difference across achievement groups on standardized tests occurred more from the drop in performance of average and overachievers than from the improvement in performance of underachievers.

Underachievers had lower grade point averages than average achievers in most course areas and in grades 7 to 10, but were not significantly lower than average achievers in grades 11 and 12. In evaluating course performance, it is necessary to consider the high dropout rate of Negro underachievers (55% for Negro males and 60% for Negro females). By the 9th grade, 38% of the underachievers had dropped out of school (compared to 21% of the average achievers). By the 10th grade, 52% of the underachievers had left school (compared to 32% of the average achievers). Although the performance of the remaining underachievers was comparable to that of average achievers in grades 11 and 12, it reflected the performance of only 17 of the original 48 underachievers.

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Reading Achievement

And Its Relationship to Academic Performance

Appendix to Parts II and III

Dee Norman Lloyd

CS000078

Mental Health Study Center

National Institute of Mental Health

Reading Achievement and Its Relationship to Academic Performance

Appendix to Parts II and III

The means, standard deviations, and analysis of variance data for achievement group comparisons discussed in Parts II and III of the report are presented in eight sections:

1. Combined samples - high SES
2. Combined samples - low SES
3. Combined samples - high IQ
4. Combined samples - low IQ
5. White males
6. White females
7. Negro males
8. Negro females

Data for the total combined samples was reported in the Appendix to Part I of this report.

Each of the eight sections contains comparison of the three achievement groups on the same 57 variables. The variables (J) are numbered as follows:

1 Age in 6th Grade (months)
2 Education Level of Father
3 Education Level of Mother
4 Number of Siblings
5 Occupation Level of Father
6 SES Level
7 6th Grade Point Average*
8 6th Grade CTMM IQ Score
9 Days Absent 1st Grade
10 Days Absent 2nd Grade

11 Days Absent 3rd Grade
12 Days Absent 4th Grade
13 3rd CAT - Reading Total*
14 6th CAT - Reading Vocabulary*
15 Outcome
16 6th CAT - Reading Comprehension*
17 3rd CTMM IQ Score
18 6th CAT - Reading Total*
19 6th CAT - Arithmetic Total*
20 6th CAT - Language Total*
21 English GPA*
22 Social Studies GPA*
23 Science GPA*
24 Mathematics GPA*
25 Business GPA*
26 Vocational GPA*
27 Foreign Language GPA*
28 Music GPA*
29 Art GPA*
30 Physical Education GPA*
31 GPA (Full Unit) 7th Grade*
32 GPA (Full Unit) 8th Grade*
33 GPA (Full Unit) 9th Grade*
34 GPA (Full Unit) 10th Grade*
35 GPA (Full Unit) 11th Grade*
36 GPA (Full Unit) 12th Grade*
37 Lorge-Thorndike IQ Score (7th Grade)
38 Lorge-Thorndike IQ Score (10th Grade)
39 Cornell Medical Index (11th Grade)
40 SAT Reading Average (7th Grade)*
41 SAT Spelling (7th Grade)*
42 SAT Language (7th Grade)*
43 SAT Arithmetic Average (7th Grade)*
44 SAT Average Achievement Score (7th Grade)*
45 SAT Paragraph Meaning (9th Grade)*
46 SAT Word Meaning (9th Grade)*
47 SAT Reading Average (9th Grade)*
48 ITED Social Concepts (9th Grade)
49 ITED Natural Science (General) (9th Grade)
50 ITED English Expression (9th Grade)
51 ITED Quantitative Thinking (9th Grade)
52 ITED Social Studies Reading (9th Grade)
53 ITED Natural Science Reading (9th Grade)
54 ITED Literature (9th Grade)
55 ITED Vocabulary (9th Grade)
56 ITED Use of Information (9th Grade)
57 Discrepancy Score (6th CAT - Reading Total Minus 6th CTMM Predicted Reading Total)

Variables followed by an asterisk (*) are fractional scores (GPA's and grade equivalent scores) that were treated as whole numbers in the computations. The decimal on means and standard deviations of these variables should be moved one place to the left for interpretation.

A constant of 10 was added to discrepancy scores (Variable #57) to avoid handling negative numbers in computations. The means of the race-by-sex samples (total column) therefore appear as 10 rather than 0. This score is also in grade equivalents, but treated in a whole number in computations and should have the decimal on the mean and standard deviation moved one place to the left for interpretation.

The omega^2 statistic is given as the proportion of variance accounted for across achievement groups, rather than as a percentage, as reported in the body of the report.

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS CF VARIANCE RUNS

LLOYD 1-148:  COMBINED SAMPLES -High SES

NO OF VARIABLES =  57     CLASSIFICATION VAR = # 57     WITH ELIMINATION CODE FOR CLAS. VAR =   999.000

CLAS CATEGORY UPPER LIMITS =   91.000, 108.000, 990.000,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,

RESTRICTION VAR = #  6     WITH RANGE OF     1.000  TC     3.000

CODES TO BE EXCLUDED FOR VARS 1 TO  57 ARE     0.0  ,   0.0  ,   0.0  ,  -9.000,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,  1.000,   0.0  ,   0.0  ,
    C.0  ,   C.0  ,   C.C  ,   0.C  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
    C.C  ,   C.0  ,   0.0  ,   0.C  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
    C.C  ,   0.C  ,   0.0  ,   0.C  ,   0.0  ,   0.0  , 999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM =  3921  DATA TO BE REAC FROM  TAPE WITHOUT REWIND
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GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14B: COMBINED SAMPLES -High SES

```
J            1        2        3      TOTAL        SOURCE          SUM OF SQUARES    DF        MEAN SQUARE   F RATIO      OMEGA SQ

    N      193     1001      293      1487     BETWEEN GROUPS       1174.9477       2         587.4738     19.4402       0.0242
 1  M  137.181  138.651  140.287   138.783     WITHIN GROUPS       44845.8916    1484          30.2196
    SD   5.600    5.403    5.742     5.565     TOTAL               46020.8393    1486

    N      192      992      292      1476     BETWEEN GROUPS         19.0721       2           9.5361      3.6695       0.0036
 2  M    2.708    2.440    2.305     2.448     WITHIN GROUPS        3827.9109    1473           2.5987
    SD   1.624    1.616    1.590     1.615     TOTAL                3846.9831    1475

    N      192      995      292      1479     BETWEEN GROUPS         19.1677       2           9.5838      3.8276       0.0038
 3  M    3.302    2.962    2.969     3.007     WITHIN GROUPS        3695.7505    1476           2.5039
    SD   1.532    1.601    1.552     1.585     TOTAL                3714.9182    1478

    N      193     1001      293      1487     BETWEEN GROUPS          1.3128       2           0.6564      0.3358      -0.0009
 4  M    1.870    1.846    1.778     1.836     WITHIN GROUPS        2900.6496    1484           1.9546
    SD   1.380    1.450    1.217     1.397     TOTAL                2901.9623    1486

    N      188      981      289      1458     BETWEEN GROUPS          7.3267       2           3.6633      2.4620       0.0020
 5  M    3.037    2.866    2.785     2.872     WITHIN GROUPS        2164.9449    1455           1.4879
    SD   1.135    1.229    1.243     1.221     TOTAL                2172.2716    1457

    N      193     1001      293      1487     BETWEEN GROUPS          5.8620       2           2.9310      3.9593       0.0040
 6  M    2.394    2.245    2.171     2.249     WITHIN GROUPS        1098.5751    1484           0.7403
    SD   0.804    0.865    0.879     0.862     TOTAL                1104.4371    1486

    N      187      969      281      1437     BETWEEN GROUPS       1911.6413       2         955.8206     42.5894       0.0547
 7  M   18.690   21.047   22.811    21.086     WITHIN GROUPS       32182.8306    1434          22.4427
    SD   4.975    4.702    4.698     4.873     TOTAL               34094.4718    1436

    N      193     1001      293      1487     BETWEEN GROUPS       1197.7817       2         598.8908      2.4645       0.0020
 8  M  107.772  109.120  106.942   108.516     WITHIN GROUPS      360615.5969    1484         243.0024
    SD  14.040   15.442   16.994    15.604     TOTAL              361813.3786    1486

    N       97      526      135       758     BETWEEN GROUPS          8.1554       2           4.0777      2.4285       0.0038
 9  M    2.969    3.057    3.304     3.090     WITHIN GROUPS        1267.7443     755           1.6791
    SD   1.104    1.305    1.384     1.298     TOTAL                1275.8997     757

    N      108      588      152       848     BETWEEN GROUPS         13.2102       2           6.6051      4.4206       0.0080
10  M    2.796    2.634    2.954     2.712     WITHIN GROUPS        1262.5822     845           1.4942
    SD   1.206    1.212    1.273     1.227     TOTAL                1275.7925     847

    N      128      685      174       987     BETWEEN GROUPS          6.1917       2           3.0959      2.0394       0.0021
11  M    2.789    2.815    3.017     2.847     WITHIN GROUPS        1493.7070     984           1.5180
    SD   1.120    1.249    1.242     1.233     TOTAL                1499.8987     986

    N      143      760      202      1105     BETWEEN GROUPS          7.4075       2           3.7037      2.5972       0.0029
12  M    2.371    2.314    2.530     2.361     WITHIN GROUPS        1571.5192    1102           1.4261
    SD   1.237    1.163    1.278     1.196     TOTAL                1578.9267    1104
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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14B:  COMBINED SAMPLES -High SES

J          1        2        3       TOTAL        SOURCE          SUM OF SQUARES    DF      MEAN SQUARE    F RATIO      OMEGA SQ

    N     119      649      163       931     BETWEEN GROUPS       6542.3112       2       3271.1556     47.2456       0.0904
13  M    35.429   41.214   45.178    41.169   WITHIN GROUPS       64252.2129     928         69.2373
    SD    9.387    8.343    7.350     8.725   TOTAL               70794.5242     930

    N     193     1000      293      1486     BETWEEN GROUPS      80788.4073       2      40394.2036    117.0072       0.1350
14  M    48.218   62.780   74.481    63.196   WITHIN GROUPS      511973.6069    1483        345.2283
    SD   29.556   16.740   14.840    19.979   TOTAL              592762.0141    1485

    N     146      768      206      1120     BETWEEN GROUPS          0.4622       2          0.2311      1.6829       0.0012
15  M     2.822    2.853    2.893     2.856   WITHIN GROUPS         153.3940    1117          0.1373
    SD    0.418    0.369    0.340     0.371   TOTAL                 153.8563    1119

    N     193     1000      292      1485     BETWEEN GROUPS      58814.3038       2      29407.1519    166.6246       0.1824
16  M    54.342   65.400   76.510    66.147   WITHIN GROUPS      261554.3992    1482        176.4874
    SD   11.309   12.918   15.542    14.693   TOTAL              320368.7030    1484

    N     120      671      170       961     BETWEEN GROUPS       1672.7721       2        836.3861      3.6739       0.0055
17  M   109.317  112.744  114.071   112.550   WITHIN GROUPS      218093.0302     958        227.6545
    SD   14.901   15.110   15.133    15.130   TOTAL              219765.8023     960

    N     193     1001      293      1487     BETWEEN GROUPS      79180.0542       2      39590.0271    252.1476       0.2525
18  M    49.290   63.498   75.263    63.972   WITHIN GROUPS      233004.7596    1484        157.0113
    SD   11.048   12.469   13.612    14.494   TOTAL              312184.8137    1486

    N     191      991      291      1473     BETWEEN GROUPS       4583.6982       2       2291.8491     38.8538       0.0489
19  M    58.853   63.350   65.024    63.098   WITHIN GROUPS       86710.2244    1470         58.9865
    SD    7.667    7.499    8.278     7.875   TOTAL               91293.9226    1472

    N     192      986      289      1467     BETWEEN GROUPS      10936.7562       2       5468.3781     63.5199       0.0785
20  M    57.500   64.103   67.142    63.838   WITHIN GROUPS      126034.6317    1464         86.0892
    SD    9.764    9.266    8.986     9.666   TOTAL              136971.3879    1466

    N     178      934      260      1372     BETWEEN GROUPS       5288.8201       2       2644.4101     31.9852       0.0432
21  M    29.567   33.445   36.623    33.544   WITHIN GROUPS      113183.4678    1369         82.6760
    SD    8.377    9.236    9.042     9.296   TOTAL              118472.2879    1371

    N     178      934      260      1372     BETWEEN GROUPS       5761.2676       2       2880.6338     34.7620       0.0469
22  M    30.006   34.049   37.369    34.154   WITHIN GROUPS      113445.2827    1369         82.8673
    SD    8.515    9.243    8.982     9.325   TOTAL              119206.5503    1371

    N     155      828      226      1209     BETWEEN GROUPS       4083.9042       2       2041.9521     22.4208       0.0342
23  M    27.619   31.307   34.270    31.388   WITHIN GROUPS      109835.1595    1206         91.0739
    SD    8.294    9.694    9.782     9.711   TOTAL              113919.0637    1208

    N     178      933      260      1371     BETWEEN GROUPS       2959.2475       2       1479.6238     16.2992       0.0218
24  M    29.393   32.480   34.685    32.497   WITHIN GROUPS      124185.4935    1368         90.7789
    SD    8.863    9.597    9.713     9.634   TOTAL              127144.7411    1370
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LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14B: COMBINED SAMPLES - High SES

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 J            1        2        3      TOTAL          SOURCE         SUM OF SQUARES    DF        MEAN SQUARE     F RATIO       OMEGA SQ

       N     89      510      135       734     BETWEEN GROUPS        2019.7165       2        1009.8583       8.0842        0.0189
 25    M  28.079   30.371   33.867    30.736    WITHIN GROUPS        91315.0083     731         124.9179
       SD  9.818   11.203   11.893    11.284    TOTAL                93334.7248     733

       N    176      931      258      1365     BETWEEN GROUPS        2439.5910       2        1219.7955      18.6431        0.0252
 26    M  33.795   36.546   38.620    36.583    WITHIN GROUPS        89114.2214    1362          65.4289
       SD  7.184    8.185    8.317     8.193    TOTAL                91553.8125    1364

       N     79      536      156       771     BETWEEN GROUPS        4790.9468       2        2395.4734      16.3676        0.0383
 27    M  24.304   30.076   33.814    30.241    WITHIN GROUPS       112400.1816     768         146.3544
       SD 10.396   12.265   12.311    12.337    TOTAL               117191.1284     770

       N    177      923      257      1357     BETWEEN GROUPS        2389.3939       2        1194.6969      15.6820        0.0212
 28    M  36.458   39.635   41.191    39.515    WITHIN GROUPS       103151.5465    1354          76.1828
       SD  8.651    8.662    9.014     8.822    TOTAL               105540.9403    1356

       N    168      871      233      1272     BETWEEN GROUPS        1194.6535       2         597.3267       7.4099        0.0100
 29    M  34.607   36.506   38.099    36.547    WITHIN GROUPS       102296.5163    1269          80.6119
       SD  8.855    9.090    8.640     9.024    TOTAL               103491.1698    1271

       N    177      928      255      1360     BETWEEN GROUPS         631.1073       2         315.5537       6.3315        0.0073
 30    M  38.288   39.956   40.714    39.881    WITHIN GROUPS        67631.5956    1357          49.8391
       SD  6.645    7.182    6.887     7.087    TOTAL                68262.7029    1359

       N    181      935      260      1376     BETWEEN GROUPS        6867.4663       2        3433.7332      36.3117        0.0488
 31    M  31.088   35.944   39.108    35.903    WITHIN GROUPS       129834.6783    1373          94.5628
       SD  9.733    9.862    9.206     9.971    TOTAL               136702.1446    1375

       N    164      879      243      1286     BETWEEN GROUPS        6514.7355       2        3257.3678      32.1066        0.0461
 32    M  30.848   34.907   38.905    35.145    WITHIN GROUPS       130166.3625    1283         101.4547
       SD  9.281   10.289    9.785    10.313    TOTAL               136681.0980    1285

       N    155      833      227      1215     BETWEEN GROUPS        4180.0056       2        2090.0028      23.4149        0.0356
 33    M  29.710   34.001   36.427    33.907    WITHIN GROUPS       108182.4849    1212          89.2595
       SD  8.189    9.539    9.898     9.621    TOTAL               112362.4905    1214

       N    148      792      215      1155     BETWEEN GROUPS        3341.1384       2        1670.5692      17.3055        0.0275
 34    M  27.547   30.479   33.619    30.687    WITHIN GROUPS       111207.0296    1152          96.5339
       SD  7.398   10.089   10.288     9.963    TOTAL               114548.1680    1154

       N    131      688      190      1009     BETWEEN GROUPS        2007.2091       2        1003.6045      12.6662        0.0226
 35    M  28.672   31.520   33.753    31.571    WITHIN GROUPS        79709.9743    1006          79.2346
       SD  8.077    9.047    8.907     9.004    TOTAL                81717.1833    1008

       N    120      645      179       944     BETWEEN GROUPS        1246.2680       2         623.1340       9.7204        0.0181
 36    M  31.367   33.805   35.531    33.822    WITHIN GROUPS        60323.8337     941          64.1061
       SD  7.339    7.996    8.460     8.080    TOTAL                61570.1017     943
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LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14B: COMBINED SAMPLES -High SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	179	925	252	1356	BETWEEN GROUPS	15312.2058	2	7656.1029	33.7051	0.0460
37	M	100.659	108.178	112.730	108.032	WITHIN GROUPS	307333.4307	1353	227.1496		
	SD	14.434	14.860	16.242	15.431	TOTAL	322645.6364	1355			
	N	135	704	192	1031	BETWEEN GROUPS	9752.5268	2	4876.2634	23.3823	0.0416
38	M	103.489	111.210	114.349	110.784	WITHIN GROUPS	214384.2395	1028	208.5450		
	SD	13.932	14.398	14.942	14.752	TOTAL	224136.7662	1030			
	N	78	457	138	673	BETWEEN GROUPS	3.2626	2	1.6313	1.0120	0.0000
39	M	2.923	2.777	2.928	2.825	WITHIN GROUPS	1080.0480	670	1.6120		
	SD	1.267	1.280	1.236	1.270	TOTAL	1083.3105	672			
	N	170	893	247	1310	BETWEEN GROUPS	44402.4816	2	22201.2408	54.7588	0.0758
40	M	64.618	76.772	85.611	76.861	WITHIN GROUPS	529906.2329	1307	405.4371		
	SD	17.897	20.349	20.800	20.946	TOTAL	574308.7145	1309			
	N	173	900	249	1322	BETWEEN GROUPS	24980.1115	2	12490.0558	37.0317	0.0517
41	M	60.405	69.206	76.032	69.340	WITHIN GROUPS	444872.3915	1319	337.2801		
	SD	16.773	18.215	19.899	18.859	TOTAL	469852.5030	1321			
	N	165	890	245	1300	BETWEEN GROUPS	46983.7276	2	23491.8638	40.4960	0.0573
42	M	56.976	71.096	78.722	70.741	WITHIN GROUPS	752393.9116	1297	580.1032		
	SD	21.457	24.157	25.454	24.807	TOTAL	799377.6392	1299			
	N	170	891	246	1307	BETWEEN GROUPS	6613.9897	2	3306.9949	19.3211	0.0273
43	M	65.247	71.068	73.118	70.697	WITHIN GROUPS	223192.0286	1304	171.1595		
	SD	11.289	13.169	13.894	13.265	TOTAL	229806.0184	1306			
	N	163	864	240	1267	BETWEEN GROUPS	26872.1878	2	13436.0939	52.1331	0.0747
44	M	62.644	72.359	79.279	72.420	WITHIN GROUPS	325766.4309	1264	257.7266		
	SD	13.728	16.152	17.126	16.690	TOTAL	352638.6188	1266			
	N	124	644	173	941	BETWEEN GROUPS	16445.0060	2	8222.5030	21.5989	0.0419
45	M	90.250	101.543	104.468	100.593	WITHIN GROUPS	357088.1078	938	380.6909		
	SD	21.427	19.160	19.373	19.934	TOTAL	373533.1137	940			
	N	123	644	173	940	BETWEEN GROUPS	21201.9746	2	10600.9873	34.4795	0.0665
46	M	93.553	104.910	110.561	104.464	WITHIN GROUPS	288087.7956	937	307.4576		
	SD	21.352	17.086	16.131	18.149	TOTAL	309289.7702	939			
	N	124	644	173	941	BETWEEN GROUPS	19662.6206	2	9831.3103	32.5500	0.0628
47	M	91.484	103.160	107.509	102.421	WITHIN GROUPS	283310.7311	938	302.0370		
	SD	20.291	16.933	16.759	17.953	TOTAL	302973.3518	940			
	N	141	741	193	1075	BETWEEN GROUPS	1533.2566	2	766.6283	24.4553	0.0418
48	M	11.106	14.152	15.321	13.963	WITHIN GROUPS	33605.2550	1072	31.3482		
	SD	5.187	5.647	5.703	5.720	TOTAL	35138.5116	1074			

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14B:  COMBINED SAMPLES -High SES

 J          1        2        3       TOTAL         SOURCE        SUM OF SQUARES    DF      MEAN SQUARE    F RATIO      OMEGA SQ

     N     137      739      191      1067     BETWEEN GROUPS       1073.4552       2        536.7276     15.8600       0.0271
 49  M   12.803   15.373   16.377    15.223    WITHIN GROUPS       36007.4576    1064         33.8416
     SD   5.855    5.806    5.834     5.898    TOTAL               37080.9128    1066

     N     141      746      202      1089     BETWEEN GROUPS       1454.4551       2        727.2276     28.9824       0.0489
 50  M   12.567   15.019   16.752    15.023    WITHIN GROUPS       27249.9710    1086         25.0921
     SD   4.057    4.939    5.806     5.136    TOTAL               28704.4261    1088

     N     141      750      197      1088     BETWEEN GROUPS        605.8540       2        302.9270      7.8998       0.0125
 51  M   13.277   15.207   15.909    15.084    WITHIN GROUPS       41605.5348    1085         38.3461
     SD   5.450    6.212    6.602     6.232    TOTAL               42211.3888    1087

     N     139      740      196      1075     BETWEEN GROUPS       1905.5269       2        952.7634     31.6483       0.0539
 52  M   11.942   15.132   16.740    15.013    WITHIN GROUPS       32272.2908    1072         30.1047
     SD   5.050    5.541    5.577     5.641    TOTAL               34177.8177    1074

     N     139      743      195      1077     BETWEEN GROUPS       1554.6889       2        777.3445     22.0520       0.0376
 53  M   11.151   13.914   15.513    13.847    WITHIN GROUPS       37859.0325    1074         35.2505
     SD   5.261    6.026    6.048     6.052    TOTAL               39413.7214    1076

     N     137      745      194      1076     BETWEEN GROUPS       2117.1885       2       1058.5943     33.1418       0.0564
 54  M   10.190   13.459   15.304    13.375    WITHIN GROUPS       34273.1237    1073         31.9414
     SD   5.078    5.685    5.902     5.818    TOTAL               36390.3123    1075

     N     143      736      195      1074     BETWEEN GROUPS       1915.0208       2        957.5104     33.7943       0.0576
 55  M   12.203   15.421   16.954    15.271    WITHIN GROUPS       30345.1328    1071         28.3335
     SD   5.131    5.333    5.422     5.483    TOTAL               32260.1536    1073

     N     141      735      193      1069     BETWEEN GROUPS       1804.6234       2        902.3117     27.3400       0.0470
 56  M   12.454   15.389   17.145    15.319    WITHIN GROUPS       35181.6011    1066         33.0034
     SD   5.545    5.708    6.022     5.885    TOTAL               36986.2245    1068

     N     193     1001      293      1487     BETWEEN GROUPS      84683.1738       2      42341.5869   2073.5206       0.7360
 57  M   87.078  100.286  113.642   101.203    WITHIN GROUPS       30303.4919    1484         20.4201
     SD   3.978    4.504    4.890     8.797    TOTAL              114986.6658    1486
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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14C:  COMBINED SAMPLES-Low SES

NO OF VARIABLES =  57     CLASSIFICATION VAR = # 57     WITH ELIMINATION CODE FOR CLAS. VAR =   999.000

CLAS CATEGORY UPPER LIMITS =   91.000, 108.000, 990.000,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,

RESTRICTION VAR = #  6     WITH RANGE OF     4.000  TO     5.000

CODES TO BE EXCLUDED FOR VARS 1 TO  57 ARE     0.0  ,   0.0  ,   0.0  ,  -9.000,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,  1.000,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  , 999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM =  3921  DATA TO BE READ FROM  TAPE WITHOUT REWIND
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GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14C: COMBINED SAMPLES -Low SES

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J            1         2         3          TOTAL        SOURCE          SUM OF SQUARES    DF        MEAN SQUARE    F RATIO     OMEGA SQ

    N      315      1401       255          1971    BETWEEN GROUPS          2353.3268      2          1176.6634    20.2273       0.0191
1   M  139.686   140.911   143.663       141.071    WITHIN GROUPS         114482.7290   1968            58.1721
    SD   7.058     7.492     8.933         7.701    TOTAL                 116836.0558   1970

    N      310      1378       250          1938    BETWEEN GROUPS             2.6677      2             1.3339     1.2699       0.0003
2   M    4.919     4.821     4.808         4.835    WITHIN GROUPS           2032.4943   1935             1.0504
    SD   1.022     1.022     1.043         1.025    TOTAL                   2035.1620   1937

    N      312      1375       251          1938    BETWEEN GROUPS             0.8198      2             0.4099     0.2663      -0.0008
3   M    4.394     4.435     4.470         4.433    WITHIN GROUPS           2978.9599   1935             1.5395
    SD   1.284     1.256     1.096         1.240    TOTAL                   2979.7797   1937

    N      315      1401       255          1971    BETWEEN GROUPS             5.3873      2             2.6936     0.5254      -0.0005
4   M    2.727     2.822     2.686         2.789    WITHIN GROUPS          10088.8116   1968             5.1264
    SD   2.075     2.310     2.232         2.264    TOTAL                  10094.1989   1970

    N      308      1377       253          1938    BETWEEN GROUPS             0.1817      2             0.0909     0.1587      -0.0009
5   M    5.429     5.439     5.411         5.434    WITHIN GROUPS           1107.8642   1935             0.5725
    SD   0.721     0.750     0.834         0.756    TOTAL                   1108.0459   1937

    N      315      1401       255          1971    BETWEEN GROUPS             0.0285      2             0.0143     0.0804      -0.0009
6   M    4.238     4.228     4.231         4.230    WITHIN GROUPS            348.8573   1968             0.1773
    SD   0.427     0.419     0.423         0.421    TOTAL                    348.8858   1970

    N      308      1355       249          1912    BETWEEN GROUPS          2470.0025      2          1235.0013    50.9632       0.0497
7   M   16.688    18.908    20.884        18.808    WITHIN GROUPS          46261.1690   1909            24.2332
    SD   4.966     4.853     5.239         5.050    TOTAL                  48731.1715   1911

    N      315      1401       255          1971    BETWEEN GROUPS          3609.5204      2          1804.7602     6.7601       0.0058
8   M  100.517    97.769    95.533        97.919    WITHIN GROUPS         525402.6531   1968           266.9729
    SD  15.682    16.011    18.751        16.387    TOTAL                 529012.1735   1970

    N      182       842       152          1176    BETWEEN GROUPS             4.5095      2             2.2547     1.0358       0.0001
9   M    2.841     2.930     3.072         2.935    WITHIN GROUPS           2553.4489   1173             2.1769
    SD   1.415     1.487     1.483         1.475    TOTAL                   2557.9583   1175

    N      201       931       167          1299    BETWEEN GROUPS             4.1572      2             2.0786     1.0811       0.0001
10  M    2.552     2.684     2.754         2.673    WITHIN GROUPS           2491.7935   1296             1.9227
    SD   1.272     1.406     1.412         1.387    TOTAL                   2495.9507   1298

    N      228      1032       188          1448    BETWEEN GROUPS             1.5578      2             0.7789     0.4739      -0.0007
11  M    2.798     2.708     2.707         2.722    WITHIN GROUPS           2374.8372   1445             1.6435
    SD   1.203     1.281     1.378         1.282    TOTAL                   2376.3950   1447

    N      251      1126       199          1576    BETWEEN GROUPS             0.7199      2             0.3599     0.2165      -0.0010
12  M    2.462     2.404     2.402         2.413    WITHIN GROUPS           2615.3708   1573             1.6627
    SD   1.321     1.274     1.333         1.289    TOTAL                   2616.0907   1575
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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14C:  COMBINED SAMPLES-Low SES

J           1        2        3        TOTAL      SOURCE            SUM OF SQUARES    DF       MEAN SQUARE    F RATIO      OMEGA SQ

    N     206      908      153       1267      BETWEEN GROUPS        4526.8005      2        2263.4003     28.8612       0.0421
13  M   33.097   36.872   40.157     36.655     WITHIN GROUPS        99127.4742   1264          78.4236
    SD   9.133    8.813    8.731      9.049     TOTAL               103654.2747   1266

    N     310     1354      251       1915      BETWEEN GROUPS       83941.4419      2       41970.7209    111.2833       0.1033
14  M   40.645   53.285   65.076     52.784     WITHIN GROUPS       721114.4881   1912         377.1519
    SD  12.962   21.096   16.376     20.509     TOTAL               805055.9300   1914

    N     267     1179      205       1651      BETWEEN GROUPS           1.1921      2           0.5960      2.5345       0.0019
15  M    2.625    2.671    2.727      2.671     WITHIN GROUPS          387.5614   1648           0.2352
    SD   0.493    0.486    0.468      0.485     TOTAL                  388.7535   1650

    N     310     1351      251       1912      BETWEEN GROUPS       47177.0274      2       23588.5137    136.8271       0.1244
16  M   49.935   57.492   68.343     57.691     WITHIN GROUPS       329104.9119   1909         172.3965
    SD  16.534   11.727   15.357     14.032     TOTAL               376281.9393   1911

    N     203      975      174       1352      BETWEEN GROUPS        1975.6439      2         987.8220      3.6921       0.0040
17  M  101.502  102.790  105.914    102.999     WITHIN GROUPS       360926.3531   1349         267.5510
    SD  16.549   16.111   17.470     16.390     TOTAL               362901.9970   1351

    N     315     1401      255       1971      BETWEEN GROUPS       74014.6639      2       37007.3320    234.5400       0.1916
18  M   43.432   54.338   66.322     54.146     WITHIN GROUPS       310524.5456   1968         157.7869
    SD  11.601   12.418   14.361     13.971     TOTAL               384539.2095   1970

    N     312     1385      252       1949      BETWEEN GROUPS        4608.3739      2        2304.1870     32.2648       0.0311
19  M   55.910   58.545   61.659     58.526     WITHIN GROUPS       138973.5676   1946          71.4150
    SD   8.736    8.399    8.377      8.585     TOTAL               143581.9415   1948

    N     309     1376      252       1937      BETWEEN GROUPS        9867.3761      2        4933.6880     46.9486       0.0453
20  M   53.909   58.384   62.250     58.173     WITHIN GROUPS       203238.3400   1934         105.0870
    SD  10.350   10.221   10.294     10.492     TOTAL               213105.7161   1936

    N     302     1314      236       1852      BETWEEN GROUPS        3202.3258      2        1601.1629     22.2286       0.0224
21  M   25.275   27.995   30.081     27.817     WITHIN GROUPS       133186.6218   1849          72.0317
    SD   7.665    8.578    8.964      8.584     TOTAL               136388.9476   1851

    N     302     1315      236       1853      BETWEEN GROUPS        3192.4369      2        1596.2185     21.4392       0.0216
22  M   25.715   28.047   30.614     27.994     WITHIN GROUPS       137738.4978   1850          74.4532
    SD   7.948    8.654    9.299      8.723     TOTAL               140930.9347   1852

    N     266     1182      211       1659      BETWEEN GROUPS        1322.8883      2         661.4442      8.0948       0.0085
23  M   25.109   26.863   28.427     26.781     WITHIN GROUPS       135315.2467   1656          81.7121
    SD   8.290    9.099    9.595      9.078     TOTAL               136638.1350   1658

    N     302     1315      236       1853      BETWEEN GROUPS        2865.7090      2        1432.8545     18.5376       0.0186
24  M   24.752   27.389   29.267     27.199     WITHIN GROUPS       142995.2073   1850          77.2947
    SD   8.214    8.796    9.458      8.875     TOTAL               145860.9164   1852
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          LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

          LLOYD 1-14C:  COMBINED SAMPLES -Low SES

 J            1        2        3       TOTAL         SOURCE          SUM OF SQUARES    DF       MEAN SQUARE    F RATIO      OMEGA SQ

     N      161      731      124      1016     BETWEEN GROUPS           104.6579       2         52.3289     0.5356      -0.0009
25   M   26.000   26.891   26.742    26.731     WITHIN GROUPS          98966.9868    1013         97.6969
     SD   9.138   10.000   10.126     9.880     TOTAL                  99071.6447    1015

     N      301     1304      235      1840     BETWEEN GROUPS           953.9672       2        476.9836     7.1714       0.0067
26   M   30.973   32.368   33.634    32.302     WITHIN GROUPS         122181.6279    1837         66.5115
     SD   7.711    8.221    8.340     8.183     TOTAL                 123135.5951    1839

     N       64      359       82       505     BETWEEN GROUPS           627.4734       2        313.7367     2.1818       0.0047
27   M   23.016   25.903   27.061    25.725     WITHIN GROUPS          72187.2672     502        143.7993
     SD  12.365   12.003   11.639    12.020     TOTAL                  72814.7406     504

     N      298     1294      231      1823     BETWEEN GROUPS          1524.4893       2        762.2446     8.7983       0.0085
28   M   32.510   34.692   35.641    34.455     WITHIN GROUPS         157675.6171    1820         86.6350
     SD   9.473    9.272    9.293     9.348     TOTAL                 159200.1064    1822

     N      287     1223      224      1734     BETWEEN GROUPS           507.9320       2        253.9660     3.2966       0.0026
29   M   31.338   32.703   33.063    32.524     WITHIN GROUPS         133354.5986    1731         77.0391
     SD   8.777    8.747    8.938     8.789     TOTAL                 133862.5306    1733

     N      299     1304      235      1838     BETWEEN GROUPS           434.8228       2        217.4114     3.0823       0.0023
30   M   35.094   35.700   36.885    35.753     WITHIN GROUPS         129433.0358    1835         70.5357
     SD   8.187    8.446    8.397     8.408     TOTAL                 129867.8585    1837

     N      301     1315      237      1853     BETWEEN GROUPS          5574.6503       2       2787.3251    30.3570       0.0307
31   M   26.814   30.281   33.203    30.092     WITHIN GROUPS         169863.7534    1850         91.8182
     SD   9.015    9.628   10.014     9.733     TOTAL                 175438.4037    1852

     N      288     1242      225      1755     BETWEEN GROUPS          3546.3506       2       1773.1753    18.5404       0.0196
32   M   26.458   29.404   31.631    29.206     WITHIN GROUPS         167558.9805    1752         95.6387
     SD   9.177    9.719   10.806     9.877     TOTAL                 171105.3311    1754

     N      259     1178      210      1647     BETWEEN GROUPS          1150.6011       2        575.3006     7.1451       0.0074
33   M   27.336   28.846   30.481    28.817     WITHIN GROUPS         132369.3892    1644         80.5167
     SD   8.050    9.084    9.416     9.007     TOTAL                 133519.9903    1646

     N      237     1063      194      1494     BETWEEN GROUPS          1078.2850       2        539.1425     6.7507       0.0076
34   M   25.401   27.024   28.562    26.967     WITHIN GROUPS         119078.0416    1491         79.8645
     SD   8.378    8.929    9.613     8.971     TOTAL                 120156.3266    1493

     N      191      892      162      1245     BETWEEN GROUPS           504.8061       2        252.4031     3.6428       0.0042
35   M   26.508   27.777   28.889    27.727     WITHIN GROUPS          86056.3425    1242         69.2885
     SD   7.428    8.400    8.884     8.342     TOTAL                  86561.1486    1244

     N      163      777      146      1086     BETWEEN GROUPS           587.0183       2        293.5091     4.9869       0.0073
36   M   28.601   30.183   31.315    30.098     WITHIN GROUPS          63740.6355    1083         58.8556
     SD   7.487    7.727    7.577     7.700     TOTAL                  64327.6538    1085
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LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14C: COMBINED SAMPLES -Low SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	291	1280	233	1804	BETWEEN GROUPS	12195.7492	2	6097.8746	28.2102	0.0293
37	M	92.464	96.717	102.172	96.736	WITHIN GROUPS	389301.1261	1801	216.1583		
	SD	13.672	14.686	15.979	14.923	TOTAL	401496.8753	1803			
	N	211	958	170	1339	BETWEEN GROUPS	3549.0348	2	1774.5174	9.3180	0.0123
38	M	98.645	100.684	104.682	100.870	WITHIN GROUPS	254428.3543	1336	190.4404		
	SD	13.366	13.636	15.183	13.886	TOTAL	257977.3891	1338			
	N	130	643	114	887	BETWEEN GROUPS	3.2446	2	1.6223	0.8860	-0.0003
39	M	3.285	3.114	3.114	3.139	WITHIN GROUPS	1618.6991	884	1.8311		
	SD	1.307	1.361	1.362	1.353	TOTAL	1621.9436	886			
	N	272	1237	225	1734	BETWEEN GROUPS	33392.7591	2	16696.3796	47.9649	0.0514
40	M	56.250	61.973	72.484	62.439	WITHIN GROUPS	602554.2610	1731	348.0960		
	SD	16.595	18.494	21.664	19.156	TOTAL	635947.0202	1733			
	N	286	1244	229	1759	BETWEEN GROUPS	21040.9114	2	10520.4557	38.0776	0.0405
41	M	53.364	60.038	66.114	59.744	WITHIN GROUPS	485164.4541	1756	276.2896		
	SD	14.917	16.849	17.379	16.969	TOTAL	506205.3655	1758			
	N	261	1175	224	1660	BETWEEN GROUPS	27901.3981	2	13950.6991	28.2042	0.0317
42	M	49.375	56.427	64.589	56.420	WITHIN GROUPS	819604.9459	1657	494.6318		
	SD	20.711	22.135	24.409	22.602	TOTAL	847506.3440	1659			
	N	278	1224	221	1723	BETWEEN GROUPS	4692.9338	2	2346.4669	15.3615	0.0164
43	M	59.867	62.598	66.041	62.599	WITHIN GROUPS	262728.9443	1720	152.7494		
	SD	11.494	12.329	13.521	12.462	TOTAL	267421.8781	1722			
	N	260	1179	219	1658	BETWEEN GROUPS	14518.8435	2	7259.4217	32.8498	0.0370
44	M	56.292	60.997	67.329	61.095	WITHIN GROUPS	365736.0998	1655	220.9886		
	SD	13.628	14.771	16.674	15.149	TOTAL	380254.9433	1657			
	N	179	777	142	1098	BETWEEN GROUPS	9421.3649	2	4710.6825	9.1484	0.0146
45	M	84.480	87.972	95.183	88.335	WITHIN GROUPS	563837.2981	1095	514.9199		
	SD	22.529	22.604	23.368	22.860	TOTAL	573258.6630	1097			
	N	178	776	142	1096	BETWEEN GROUPS	15126.9992	2	7563.4996	16.2153	0.0270
46	M	85.298	91.276	99.134	91.323	WITHIN GROUPS	509822.6614	1093	466.4434		
	SD	21.673	21.690	20.984	21.895	TOTAL	524949.6606	1095			
	N	178	777	142	1097	BETWEEN GROUPS	12008.6021	2	6004.3010	13.6775	0.0226
47	M	84.916	89.542	97.169	89.778	WITHIN GROUPS	480254.5702	1094	438.9896		
	SD	20.875	20.930	21.169	21.193	TOTAL	492263.1723	1096			
	N	226	1046	189	1461	BETWEEN GROUPS	790.1775	2	395.0887	16.3185	0.0205
48	M	9.810	10.754	12.534	10.838	WITHIN GROUPS	35299.7007	1458	24.2110		
	SD	4.899	4.855	5.293	4.972	TOTAL	36089.8782	1460			

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14C:  COMBINED SAMPLES -Low SES

 J              1          2          3          TOTAL        SOURCE           SUM OF SQUARES     DF        MEAN SQUARE    F RATIO       OMEGA SQ

     N        226       1040        188          1454     BETWEEN GROUPS        890.4306          2         445.2153      13.4467        0.0168
 49  M     10.230     11.583     13.176        11.578     WITHIN GROUPS       48042.1313       1451          33.1097
     SD     5.705      5.711      6.046         5.803     TOTAL               48932.5619       1453

     N        226       1042        191          1459     BETWEEN GROUPS        365.3287          2         182.6644       7.7604        0.0092
 50  M     11.049     11.937     12.927        11.929     WITHIN GROUPS       34271.2580       1456          23.5380
     SD     4.831      4.828      5.003         4.874     TOTAL               34636.5867       1458

     N        229       1035        191          1455     BETWEEN GROUPS        327.0759          2         163.5380       5.0715        0.0056
 51  M     11.044     11.496     12.733        11.587     WITHIN GROUPS       46821.6760       1452          32.2463
     SD     5.537      5.608      6.202         5.694     TOTAL               47148.7519       1454

     N        229       1042        188          1459     BETWEEN GROUPS        878.8895          2         439.4448      18.0602        0.0229
 52  M     10.672     11.773     13.569        11.831     WITHIN GROUPS       35427.6328       1456          24.3322
     SD     4.796      4.805      5.735         4.990     TOTAL               36306.5223       1458

     N        229       1051        188          1468     BETWEEN GROUPS        872.4598          2         436.2299      14.6756        0.0183
 53  M      9.559     10.665     12.447        10.721     WITHIN GROUPS       43547.0307       1465          29.7249
     SD     5.344      5.340      6.157         5.503     TOTAL               44419.4905       1467

     N        231       1041        187          1459     BETWEEN GROUPS        888.6371          2         444.3185      15.4156        0.0194
 54  M      8.827     10.311     11.743        10.260     WITHIN GROUPS       41965.9112       1456          28.8227
     SD     5.286      5.282      5.923         5.422     TOTAL               42854.5483       1458

     N        231       1041        193          1465     BETWEEN GROUPS       1038.3445          2         519.1722      19.1357        0.0242
 55  M     10.351     11.584     13.477        11.639     WITHIN GROUPS       39665.6378       1462          27.1311
     SD     5.139      5.133      5.675         5.273     TOTAL               40703.9823       1464

     N        228       1026        188          1442     BETWEEN GROUPS        607.9809          2         303.9904      10.5967        0.0131
 56  M     10.570     11.534     12.989        11.571     WITHIN GROUPS       41281.1620       1439          28.6874
     SD     5.242      5.258      5.990         5.392     TOTAL               41889.1429       1441

     N        315       1401        255          1971     BETWEEN GROUPS     101136.4990          2       50568.2495    2453.2813        0.7133
 57  M     86.695     99.542    113.443        99.288     WITHIN GROUPS       40565.3914       1968          20.6125
     SD     4.715      4.459      4.757         8.481     TOTAL              141701.8904       1970
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LLCYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14E:  COMBINED SAMPLES-High IQ

NO OF VARIABLES =  57     CLASSIFICATICN VAR = # 57     WITH ELIMINATION CODE FOR CLAS. VAR =   999.000

CLAS CATEGORY UPPER LIMITS =   91.000, 108.000, 990.000,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,

RESTRICTION VAR = #  8     WITH RANGE OF   100.000  TO   175.000

CODES TO BE EXCLUDED FOR VARS 1 TO  57 ARE     0.0  ,   0.0  ,   0.0  ,  -9.000,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   1.000,   0.0  ,   0.0  ,
    C.0  ,   C.C  ,   0.0  ,   0.C  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
    0.0  ,   C.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
    C.0  ,   0.0  ,   0.0  ,   0.C  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.C  ,
    0.0  ,   C.C  ,   0.0  ,   0.C  ,   0.0  ,   0.0  ,  999.000,

FORMAT OF DATA IS (57F6.C)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM =  3921  DATA TO BE READ FROM  TAPE WITHOUT REWIND
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GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLCYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLCYD 1-14E: COMBINED SAMPLES -High IQ

J		1	2	3	TOTAL	SCURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	319	1495	343	2157	BETWEEN GROUPS	1071.4690	2	535.7345	27.7581	0.0242
1	M	136.878	138.058	139.414	138.099	WITHIN GROUPS	41572.4976	2154	19.3001		
	SD	4.645	4.373	4.237	4.447	TOTAL	42643.9666	2156			
	N	307	1432	326	2065	BETWEEN GROUPS	79.7334	2	39.8667	12.6302	0.0111
2	M	3.756	3.375	3.046	3.380	WITHIN GROUPS	6508.6123	2062	3.1565		
	SD	1.740	1.769	1.845	1.787	TOTAL	6588.3458	2064			
	N	306	1441	327	2074	BETWEEN GROUPS	17.3786	2	8.6893	3.5746	0.0025
3	M	3.663	3.474	3.333	3.480	WITHIN GROUPS	5034.2708	2071	2.4308		
	SD	1.453	1.577	1.573	1.561	TOTAL	5051.6495	2073			
	N	319	1495	343	2157	BETWEEN GROUPS	3.0718	2	1.5359	0.5974	-0.0004
4	M	1.918	1.920	1.816	1.903	WITHIN GROUPS	5537.6773	2154	2.5709		
	SD	1.529	1.648	1.466	1.603	TOTAL	5540.7492	2156			
	N	300	1417	324	2041	BETWEEN GROUPS	61.4610	2	30.7305	11.4298	0.0101
5	M	4.230	4.004	3.620	3.976	WITHIN GROUPS	5479.4101	2038	2.6886		
	SD	1.518	1.650	1.701	1.648	TOTAL	5540.8711	2040			
	N	305	1428	324	2057	BETWEEN GROUPS	45.2116	2	22.6058	15.4711	0.0139
6	M	3.328	3.097	2.796	3.084	WITHIN GROUPS	3001.2386	2054	1.4612		
	SD	1.134	1.211	1.265	1.217	TOTAL	3046.4502	2056			
	N	301	1410	317	2028	BETWEEN GROUPS	3021.2850	2	1510.6425	88.0618	0.0791
7	M	19.784	21.851	24.196	21.911	WITHIN GROUPS	34737.5607	2025	17.1544		
	SD	4.247	4.102	4.217	4.316	TOTAL	37758.8457	2027			
	N	319	1495	343	2157	BETWEEN GROUPS	468.6077	2	234.3038	2.5002	0.0014
8	M	113.611	113.533	114.819	113.749	WITHIN GROUPS	201860.7034	2154	93.7143		
	SD	9.108	9.758	9.854	9.687	TOTAL	202329.3111	2156			
	N	165	793	180	1138	BETWEEN GROUPS	10.5023	2	5.2511	3.0404	0.0036
9	M	2.873	2.997	3.211	3.013	WITHIN GROUPS	1960.3000	1135	1.7271		
	SD	1.149	1.346	1.316	1.317	TOTAL	1970.8023	1137			
	N	184	897	201	1282	BETWEEN GROUPS	2.0862	2	1.0431	0.6120	-0.0006
10	M	2.663	2.695	2.796	2.706	WITHIN GROUPS	2180.0487	1279	1.7045		
	SD	1.153	1.326	1.347	1.305	TOTAL	2182.1349	1281			
	N	208	1020	226	1454	BETWEEN GROUPS	2.2953	2	1.1477	0.7618	-0.0003
11	M	2.731	2.782	2.872	2.789	WITHIN GROUPS	2185.8842	1451	1.5065		
	SD	1.038	1.244	1.309	1.227	TOTAL	2188.1795	1453			
	N	232	1130	249	1611	BETWEEN GROUPS	0.4208	2	0.2104	0.1528	-0.0011
12	M	2.358	2.317	2.345	2.327	WITHIN GROUPS	2214.1838	1608	1.3770		
	SD	1.268	1.151	1.185	1.173	TOTAL	2214.6046	1610			

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        LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

        LLOYD 1-14E:  COMBINED SAMPLES -High IQ

 J            1         2         3        TOTAL        SOURCE          SUM OF SQUARES    DF       MEAN SQUARE    F RATIC      OMEGA SQ

      N      19C       961       201       1352    BETWEEN GROUPS        7520.C367       2        3760.0183     74.2915       0.0978
 13   M   37.984    42.814    46.741     42.719    WITHIN GROUPS        68275.1586    1349          50.6117
      SD   8.299     7.134     5.660      7.490    TOTAL                75795.1953    1351

      N      318      1487       342       2147    BETWEEN GROUPS      146342.9033       2       73171.4516    287.4728       0.2106
 14   M   50.465    66.41C    80.254     66.254    WITHIN GROUPS       545719.7525    2144         254.5335
      SD  10.889    17.776    10.634     17.958    TOTAL               692C62.6558    2146

      N      253      1155       245       1653    BETWEEN GROUPS           0.3899       2           0.1950      1.4551       0.0006
 15   M    2.838     2.867     2.894      2.866    WITHIN GROUPS          221.0632    165C           0.1340
      SD   C.40C     0.365     0.334      0.366    TOTAL                  221.4531    1652

      N      318      1487       341       2146    BETWEEN GROUPS      102838.6465       2       51419.3232    384.1630       0.2631
 16   M   57.965    67.541    82.431     68.488    WITHIN GROUPS       286835.5385    2143         133.8477
      SD  14.927    1C.576    12.126     13.478    TOTAL               389674.1850    2145

      N      195      1C0C       224       1419    BETWEEN GROUPS        4396.4406       2        2198.2203     12.0700       0.0154
 17   M  110.774   113.72C   117.214    113.867    WITHIN GROUPS       257885.3861    1416         182.1224
      SD  13.668    13.564    13.027     13.600    TOTAL               262281.8266    1418

      N      319      1495       343       2157    BETWEEN GROUPS      13C561.8552       2       65280.9276    839.4946       0.4374
 18   M   52.828    66.299    80.878     66.625    WITHIN GROUPS       167499.7229    2154          77.7622
      SD   8.463     8.832     9.077     11.758    TOTAL               298061.5781    2156

      N      315      1482       340       2137    BETWEEN GROUPS        6616.1053       2        3308.0527     83.9457       0.0720
 19   M   61.279    64.679    67.638     64.649    WITHIN GROUPS        84094.6752    2134          39.4071
      SD   6.272     6.175     6.710      6.517    TOTAL                9C710.7805    2136

      N      312      1474       338       2124    BETWEEN GROUPS       14165.2760       2        7082.6380    129.2772       0.1078
 20   M   6C.955    66.016    70.293     65.953    WITHIN GROUPS       116202.0159    2121          54.7864
      SD   7.576     7.431     7.106      7.836    TOTAL               13C367.2919    2123

      N      295      1364       300       1959    BETWEEN GROUPS        8752.9068       2        4376.4534     62.4047       0.0590
 21   M   29.969    34.164    37.620     34.062    WITHIN GROUPS       137174.6195    1956          70.1302
      SD   7.949     8.448     8.446      8.633    TOTAL               145927.5263    1958

      N      295      1365       300       1960    BETWEEN GROUPS        9763.2041       2        4881.6021     68.6150       0.0645
 22   M   30.369    34.541    38.47C     34.515    WITHIN GROUPS       139230.3668    1957          71.1448
      SD   8.123     8.509     8.394      8.721    TOTAL               148993.5709    1959

      N      27C      1245       266       1781    BETWEEN GROUPS        6918.47C7       2        3459.2354     42.7480       0.0448
 23   M   28.263    31.908    35.447     31.884    WITHIN GROUPS       143878.4703    1778          80.9215
      SD   8.125     9.203     8.853      9.204    TOTAL               15C796.9410    178C

      N      295      1364       300       1959    BETWEEN GROUPS        6817.7021       2        3408.8510     43.7817       0.0418
 24   M   29.641    33.279    36.400     33.209    WITHIN GROUPS       152294.4888    1956          77.8602
      SD   8.447     8.893     8.871      9.015    TOTAL               159112.1909    1958
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LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14E: COMBINED SAMPLES -High IQ

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 J              1        2        3        TOTAL          SOURCE         SUM OF SQUARES    DF        MEAN SQUARE    F RATIO       OMEGA SQ

      N       176      827      157        1160      BETWEEN GROUPS        3193.0635       2         1596.5318     14.6160        0.0229
 25   M    28.398   31.060   34.586      31.134      WITHIN GROUPS       126381.2253    1157          109.2318
      SD    9.440   10.575   10.865      10.573      TOTAL               129574.2888    1159

      N       294     1355      299        1948      BETWEEN GROUPS        3791.0647       2         1895.5324     30.5873        0.0295
 26   M    34.041   36.811   39.084      36.742      WITHIN GROUPS       120534.0539    1945           61.9712
      SD    7.443    7.918    8.070       7.991      TOTAL               124325.1186    1947

      N       117      752      185        1054      BETWEEN GROUPS        5853.7209       2         2926.8605     20.2049        0.0352
 27   M    25.171   29.947   34.124      30.150      WITHIN GROUPS       152246.5941    1051          144.8588
      SD   11.256   12.173   11.946      12.253      TOTAL               158100.3150    1053

      N       294     1346      297        1937      BETWEEN GROUPS        3270.9756       2         1635.4878     23.6540        0.0229
 28   M    36.864   39.950   41.364      39.699      WITHIN GROUPS       133720.9500    1934           69.1422
      SD    8.491    8.218    8.573       8.412      TOTAL               136991.9257    1936

      N       283     1249      271        1803      BETWEEN GROUPS        1887.3635       2          943.6818     12.5417        0.0126
 29   M    34.618   36.882   38.214      36.727      WITHIN GROUPS       135438.8339    1800           75.2438
      SD    8.721    8.601    8.957       8.730      TOTAL               137326.1974    1802

      N       292     1356      299        1947      BETWEEN GROUPS        1413.7661       2          706.8831     14.7537        0.0139
 30   M    38.017   39.962   41.030      39.834      WITHIN GROUPS        93141.6494    1944           47.9124
      SD    6.826    6.983    6.735       6.971      TOTAL                94555.4155    1946

      N       298     1360      302        1960      BETWEEN GROUPS       12239.8233       2         6119.9116     76.0881        0.0712
 31   M    31.836   36.981   40.808      36.788      WITHIN GROUPS       157405.3068    1957           80.4319
      SD    9.300    9.029    8.336       9.306      TOTAL               169645.1301    1959

      N       282     1284      287        1853      BETWEEN GROUPS       10873.7513       2         5436.8757     61.3185        0.0611
 32   M    31.227   35.815   39.965      35.760      WITHIN GROUPS       164032.3814    1850           88.6662
      SD    9.058    9.530    9.248       9.718      TOTAL               174906.1328    1852

      N       265     1249      270        1788      BETWEEN GROUPS        7020.5377       2         3510.2689     44.5619        0.0465
 33   M    30.379   34.473   37.548      34.322      WITHIN GROUPS       140609.5490    1785           78.7729
      SD    7.934    9.030    9.036       9.089      TOTAL               147630.0867    1787

      N       261     1196      254        1711      BETWEEN GROUPS        6164.2196       2         3082.1098     36.0102        0.0393
 34   M    28.314   31.211   35.185      31.359      WITHIN GROUPS       146187.4437    1708           85.5898
      SD    7.866    9.531    9.230       9.439      TOTAL               152351.6634    1710

      N       228     1062      233        1523      BETWEEN GROUPS        2973.3877       2         1486.6938     19.7186        0.0240
 35   M    29.004   31.725   34.077      31.678      WITHIN GROUPS       114601.3188    1520           75.3956
      SD    7.585    8.812    9.086       8.789      TOTAL               117574.7065    1522

      N       207      983      216        1406      BETWEEN GROUPS        2360.7540       2         1180.3770     19.2214        0.0253
 36   M    31.290   33.781   36.014      33.757      WITHIN GROUPS        86157.5426    1403           61.4095
      SD    7.312    7.905    8.005       7.937      TOTAL                88518.2966    1405
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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14E:  COMBINED SAMPLES-High IQ

 J          1        2        3       TOTAL        SOURCE          SUM OF SQUARES    DF       MEAN SQUARE    F RATIO      OMEGA SQ

    N      291     1331      294       1916   BETWEEN GROUPS       30579.2089      2      15289.6045     105.2216       0.0981
37  M  102.990  110.165  117.449    110.193   WITHIN GROUPS       277975.3401   1913        145.3086
    SD  11.899   12.083   12.079     12.694   TOTAL               308554.5491   1915

    N      239     1075      228       1542   BETWEEN GROUPS       17632.7933      2       8816.3967      60.9654       0.0722
38  M  105.469  112.087  117.715    111.894   WITHIN GROUPS       222559.7644   1539        144.6132
    SD  12.213   11.963   12.124     12.485   TOTAL               240192.5577   1541

    N      151      724      160       1035   BETWEEN GROUPS           5.4946      2          2.7473       1.5775       0.0011
39  M    3.073    2.863    2.906      2.900   WITHIN GROUPS         1797.2551   1032          1.7415
    SD   1.302    1.334    1.268      1.320   TOTAL                 1802.7498   1034

    N      282     1306      289       1877   BETWEEN GROUPS       89453.7679      2      44726.8839     149.2665       0.1364
40  M   66.631   78.607   91.640     78.815   WITHIN GROUPS       561533.7121   1874        299.6445
    SD  16.251   17.612   16.930     18.628   TOTAL               650987.4800   1876

    N      290     1314      292       1896   BETWEEN GROUPS       43957.6159      2      21978.8079      84.1246       0.0806
41  M   62.717   71.782   80.089     71.675   WITHIN GROUPS       494574.2491   1893        261.2648
    SD  14.900   16.343   16.551     16.858   TOTAL               538531.8650   1895

    N      279     1303      291       1873   BETWEEN GROUPS       87180.4500      2      43590.2250      97.4841       0.0934
42  M   59.932   73.380   84.632     73.125   WITHIN GROUPS       836174.3156   1870        447.1520
    SD  19.894   21.342   21.422     22.209   TOTAL               923354.7656   1872

    N      280     1307      286       1873   BETWEEN GROUPS       14300.2796      2       7150.1398      55.5389       0.0550
43  M   66.704   72.343   76.710     72.167   WITHIN GROUPS       240745.7482   1870        128.7410
    SD  10.299   11.516   11.541     11.672   TOTAL               255046.0278   1872

    N      272     1263      281       1816   BETWEEN GROUPS       47004.4740      2      23502.2370     132.4718       0.1265
44  M   65.029   74.279   83.470     74.316   WITHIN GROUPS       321650.0965   1813        177.4132
    SD  12.052   13.514   13.604     14.252   TOTAL               368654.5705   1815

    N      211      966      201       1378   BETWEEN GROUPS       31897.0246      2      15948.5123      56.7059       0.0748
45  M   93.588  102.988  111.134    102.737   WITHIN GROUPS       386718.3520   1375        281.2497
    SD  19.562   16.946   12.095     17.436   TOTAL               418615.3766   1377

    N      210      966      201       1377   BETWEEN GROUPS       37715.1468      2      18857.5734      87.4279       0.1115
46  M   96.205  106.483  115.303    106.203   WITHIN GROUPS       296361.9178   1374        215.6928
    SD  17.838   14.838    9.324     15.582   TOTAL               334077.0646   1376

    N      211      966      201       1378   BETWEEN GROUPS       35710.1246      2      17855.0623      86.4085       0.1103
47  M   94.664  104.710  113.214    104.412   WITHIN GROUPS       284123.7506   1375        206.6355
    SD  17.328   14.519    9.397     15.240   TOTAL               319833.8752   1377

    N      242     1131      232       1605   BETWEEN GROUPS        2668.5460      2       1334.2730      50.0137       0.0576
48  M   11.682   14.078   16.427     14.056   WITHIN GROUPS        42738.4073   1602         26.6782
    SD   5.037    5.195    5.150      5.321   TOTAL                45406.9533   1604
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LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14E: COMBINED SAMPLES-High IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	241	1125	226	1592	BETWEEN GROUPS	2782.5249	2	1391.2624	44.3662	0.0517
49	M	12.602	15.332	17.442	15.218	WITHIN GROUPS	49828.8413	1589	31.3586		
	SD	5.963	5.595	5.210	5.750	TOTAL	52611.3662	1591			
	N	243	1133	239	1615	BETWEEN GROUPS	2447.8644	2	1223.9322	60.0409	0.0681
50	M	13.202	15.295	17.703	15.336	WITHIN GROUPS	32860.5666	1612	20.3850		
	SD	4.089	4.526	4.862	4.677	TOTAL	35308.4310	1614			
	N	246	1133	237	1616	BETWEEN GROUPS	1566.2158	2	783.1079	23.7138	0.0273
51	M	13.622	15.356	17.224	15.366	WITHIN GROUPS	53266.6449	1613	33.0233		
	SD	5.498	5.761	5.927	5.827	TOTAL	54832.8608	1615			
	N	245	1131	236	1612	BETWEEN GROUPS	3413.1211	2	1706.5605	69.8773	0.0787
52	M	12.547	15.319	17.869	15.271	WITHIN GROUPS	39295.4118	1609	24.4223		
	SD	4.823	4.983	4.867	5.149	TOTAL	42708.5329	1611			
	N	246	1136	232	1614	BETWEEN GROUPS	2956.0099	2	1478.0050	47.2198	0.0542
53	M	11.549	14.064	16.522	14.034	WITHIN GROUPS	50425.1159	1611	31.3005		
	SD	5.306	5.638	5.680	5.753	TOTAL	53381.1258	1613			
	N	243	1137	232	1612	BETWEEN GROUPS	3276.3277	2	1638.1639	60.8283	0.0691
54	M	11.033	13.860	16.267	13.780	WITHIN GROUPS	43331.9328	1609	26.9310		
	SD	5.057	5.177	5.386	5.379	TOTAL	46608.2605	1611			
	N	247	1131	232	1610	BETWEEN GROUPS	3987.0315	2	1993.5158	87.4406	0.0970
55	M	12.632	15.549	18.401	15.512	WITHIN GROUPS	36637.2200	1607	22.7985		
	SD	4.914	4.794	4.522	5.025	TOTAL	40624.2516	1609			
	N	245	1121	231	1597	BETWEEN GROUPS	3298.9303	2	1649.4652	57.3644	0.0659
56	M	12.841	15.384	18.108	15.388	WITHIN GROUPS	45834.1442	1594	28.7542		
	SD	5.226	5.393	5.356	5.548	TOTAL	49133.0745	1596			
	N	319	1495	343	2157	BETWEEN GROUPS	124485.6321	2	62242.8160	2879.9145	0.7275
57	M	86.320	99.945	113.746	100.125	WITHIN GROUPS	46553.8209	2154	21.6127		
	SD	4.955	4.504	4.966	8.907	TOTAL	171039.4529	2156			

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14D:  COMBINED SAMPLES-Low IQ

NO OF VARIABLES =  57     CLASSIFICATION VAR = # 57     WITH ELIMINATION CODE FOR CLAS. VAR =    999.000

CLAS CATEGORY UPPER LIMITS =   91.000, 108.000, 990.000,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,

RESTRICTION VAR = #  8     WITH RANGE OF    50.000  TO    99.000

CODES TO BE EXCLUDED FOR VARS 1 TO  57 ARE     0.0  ,    0.0  ,    0.0  ,  -9.000,    0.0  ,    0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,  1.000,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  , 999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM =  3921  DATA TO BE READ FROM  TAPE WITHOUT REWIND
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GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14D: COMBINED SAMPLES - Low IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	217	1042	235	1494	BETWEEN GROUPS	1619.9243	2	809.9621	10.4796	0.0125
1	M	141.834	142.921	145.400	143.153	WITHIN GROUPS	115237.9747	1491	77.2891		
	SD	8.368	8.645	9.764	8.847	TOTAL	116857.8989	1493			
	N	201	989	223	1413	BETWEEN GROUPS	38.7701	2	19.3851	8.4224	0.0104
2	M	4.597	4.508	4.076	4.452	WITHIN GROUPS	3245.2554	1410	2.3016		
	SD	1.429	1.499	1.668	1.525	TOTAL	3284.0255	1412			
	N	206	985	224	1416	BETWEEN GROUPS	11.4389	2	5.7195	2.7721	0.0025
3	M	4.456	4.368	4.152	4.347	WITHIN GROUPS	2915.3061	1413	2.0632		
	SD	1.423	1.452	1.377	1.438	TOTAL	2926.7451	1415			
	N	217	1042	235	1494	BETWEEN GROUPS	40.0497	2	20.0249	3.5291	0.0034
4	M	2.995	3.019	2.566	2.944	WITHIN GROUPS	8460.3392	1491	5.6743		
	SD	2.272	2.448	2.176	2.386	TOTAL	8500.3889	1493			
	N	201	966	222	1389	BETWEEN GROUPS	21.3806	2	10.6903	5.4129	0.0063
5	M	5.005	4.945	4.622	4.902	WITHIN GROUPS	2737.3034	1386	1.9750		
	SD	1.279	1.401	1.528	1.410	TOTAL	2758.6839	1388			
	N	203	974	224	1401	BETWEEN GROUPS	10.5134	2	5.2567	5.7369	0.0067
6	M	3.852	3.847	3.612	3.810	WITHIN GROUPS	1280.9827	1398	0.9163		
	SD	0.900	0.947	1.049	0.960	TOTAL	1291.4961	1400			
	N	203	961	220	1384	BETWEEN GROUPS	2432.2664	2	1216.1332	65.9613	0.0858
7	M	13.818	16.602	18.591	16.510	WITHIN GROUPS	25461.5920	1381	18.4371		
	SD	3.990	4.364	4.254	4.491	TOTAL	27893.8584	1383			
	N	217	1042	235	1494	BETWEEN GROUPS	2533.0639	2	1266.5319	11.6546	0.0141
8	M	87.659	86.056	83.098	85.823	WITHIN GROUPS	162030.2855	1491	108.6722		
	SD	8.416	10.489	11.732	10.499	TOTAL	164563.3494	1493			
	N	120	598	109	827	BETWEEN GROUPS	2.8400	2	1.4200	0.6024	-0.0010
9	M	2.925	2.953	3.119	2.971	WITHIN GROUPS	1942.4635	824	2.3574		
	SD	1.540	1.519	1.620	1.535	TOTAL	1945.3035	826			
	N	132	649	121	902	BETWEEN GROUPS	8.6277	2	4.3138	2.2914	0.0029
10	M	2.629	2.641	2.926	2.677	WITHIN GROUPS	1692.4910	899	1.8826		
	SD	1.432	1.364	1.349	1.374	TOTAL	1701.1186	901			
	N	155	730	139	1024	BETWEEN GROUPS	6.6074	2	3.3037	1.9123	0.0018
11	M	2.910	2.700	2.827	2.749	WITHIN GROUPS	1763.8916	1021	1.7276		
	SD	1.350	1.303	1.335	1.316	TOTAL	1770.4990	1023			
	N	169	793	155	1117	BETWEEN GROUPS	4.7646	2	2.3823	1.2696	0.0005
12	M	2.550	2.473	2.658	2.510	WITHIN GROUPS	2090.3670	1114	1.8765		
	SD	1.345	1.359	1.452	1.370	TOTAL	2095.1316	1116			

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14D:  COMBINED SAMPLES - Low IQ

 J           1        2        3       TOTAL        SOURCE           SUM OF SQUARES    DF      MEAN SQUARE    F RATIO      OMEGA SQ

      N     143      627      119       889     BETWEEN GROUPS        4114.5895        2       2057.2947     35.4517       0.0719
 13   M   28.070   32.126   35.992    31.991    WITHIN GROUPS        51415.3385      886         58.0309
      SD   7.354    7.574    8.144     7.908    TOTAL                55529.9280      888

      N     211     1000      232      1443     BETWEEN GROUPS       59113.5016        2      29556.7508    114.1702       0.1356
 14   M   32.758   43.341   55.759    43.790    WITHIN GROUPS       372791.8747     1440        258.8832
      SD  27.173   13.601   11.942    17.307    TOTAL               431905.3763     1442

      N     170      845      175      1190     BETWEEN GROUPS           4.5378        2          2.2689      9.0156       0.0133
 15   M    2.459    2.554    2.686     2.560    WITHIN GROUPS          298.7261     1187          0.2517
      SD   0.500    0.504    0.490     0.505    TOTAL                  303.2639     1189

      N     211      997      232      1440     BETWEEN GROUPS       31637.9924        2      15818.9962    225.1432       0.2374
 16   M   41.567   50.429   58.875    50.550    WITHIN GROUPS       100966.4076     1437         70.2619
      SD   7.406    8.267    9.621     9.599    TOTAL               132604.4000     1439

      N     138      680      129       947     BETWEEN GROUPS        1036.0580        2        518.0290      2.2843       0.0027
 17   M   94.036   96.384   97.891    96.247    WITHIN GROUPS       214082.1215      944        226.7819
      SD  15.417   14.851   15.752    15.080    TOTAL               215118.1795      946

      N     217     1042      235      1494     BETWEEN GROUPS       57482.5666        2      28741.2833    386.2083       0.3402
 18   M   34.765   46.022   57.323    46.165    WITHIN GROUPS       110958.9274     1491         74.4191
      SD   6.623    8.746    9.663    10.622    TOTAL               168441.4940     1493

      N     215     1028      233      1476     BETWEEN GROUPS        5875.5247        2       2937.7623     53.5929       0.0665
 19   M   50.395   54.208   57.644    54.195    WITHIN GROUPS        80744.2802     1473         54.8162
      SD   7.087    7.439    7.533     7.663    TOTAL                86619.8049     1475

      N     216     1021      233      1470     BETWEEN GROUPS       12817.3053        2       6408.6527     87.1890       0.1050
 20   M   46.750   52.931   57.386    52.729    WITHIN GROUPS       107828.9368     1467         73.5030
      SD   7.676    8.737    8.637     9.062    TOTAL               120646.2422     1469

      N     195      945      208      1348     BETWEEN GROUPS        3004.7261        2       1502.3631     31.5945       0.0434
 21   M   21.513   24.268   27.327    24.399    WITHIN GROUPS        63956.5528     1345         47.5513
      SD   5.808    6.916    7.695     7.051    TOTAL                66961.2789     1347

      N     195      945      208      1348     BETWEEN GROUPS        2943.7310        2       1471.8655     29.5485       0.0406
 22   M   22.415   24.387   27.678    24.610    WITHIN GROUPS        66997.0197     1345         49.8119
      SD   6.321    7.006    7.898     7.206    TOTAL                69940.7507     1347

      N     158      815      181      1154     BETWEEN GROUPS        1031.0002        2        515.5001      8.1937       0.0123
 23   M   22.095   23.452   25.503    23.588    WITHIN GROUPS        72414.6602     1151         62.9146
      SD   7.309    7.821    8.895     7.981    TOTAL                73445.6603     1153

      N     195      945      208      1348     BETWEEN GROUPS        1775.3953        2        887.6976     17.1188       0.0234
 24   M   21.600   23.622   25.793    23.665    WITHIN GROUPS        69745.0439     1345         51.8551
      SD   6.728    7.099    8.042     7.287    TOTAL                71520.4392     1347
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LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14D: COMBINED SAMPLES-Low IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
25	N	77	438	106	621	BETWEEN GROUPS	142.9400	2	71.4700	0.9583	-0.0001
	M	22.974	22.947	24.226	23.169	WITHIN GROUPS	46090.3063	618	74.5798		
	SD	8.169	8.459	9.637	8.635	TOTAL	46233.2464	620			
26	N	193	941	206	1340	BETWEEN GROUPS	1144.8472	2	572.4236	10.1758	0.0135
	M	28.746	29.925	32.024	30.078	WITHIN GROUPS	75211.0812	1337	56.2536		
	SD	6.723	7.598	7.735	7.551	TOTAL	76355.9284	1339			
27	N	27	152	59	238	BETWEEN GROUPS	732.3395	2	366.1697	3.6175	0.0215
	M	17.704	20.428	23.576	20.899	WITHIN GROUPS	23787.2404	235	101.2223		
	SD	9.285	9.864	10.869	10.171	TOTAL	24519.5798	237			
28	N	191	932	203	1326	BETWEEN GROUPS	2219.8955	2	1109.9478	13.9355	0.0191
	M	29.414	31.817	34.163	31.830	WITHIN GROUPS	105375.5856	1323	79.6490		
	SD	8.860	8.846	9.338	9.011	TOTAL	107595.4811	1325			
29	N	181	904	198	1283	BETWEEN GROUPS	729.9659	2	364.9830	5.2795	0.0066
	M	29.094	30.374	31.859	30.422	WITHIN GROUPS	88489.0676	1280	69.1321		
	SD	8.189	8.405	8.006	8.342	TOTAL	89219.0335	1282			
30	N	194	936	203	1333	BETWEEN GROUPS	732.6014	2	366.3007	5.1677	0.0062
	M	33.577	33.553	35.621	33.872	WITHIN GROUPS	94274.4624	1330	70.8831		
	SD	8.417	8.474	8.165	8.446	TOTAL	95007.0638	1332			
31	N	193	950	207	1350	BETWEEN GROUPS	4237.0448	2	2118.5224	34.4908	0.0473
	M	22.979	26.005	29.469	26.104	WITHIN GROUPS	82736.4367	1347	61.4227		
	SD	6.844	7.820	8.733	8.029	TOTAL	86973.4815	1349			
32	N	180	890	193	1263	BETWEEN GROUPS	2977.9211	2	1488.9605	22.4855	0.0329
	M	22.683	25.343	28.321	25.419	WITHIN GROUPS	83435.5104	1260	66.2187		
	SD	7.482	7.926	9.564	8.275	TOTAL	86413.4315	1262			
33	N	152	812	178	1142	BETWEEN GROUPS	838.1202	2	419.0601	7.0978	0.0106
	M	24.355	25.259	27.326	25.461	WITHIN GROUPS	67247.6066	1139	59.0409		
	SD	7.105	7.579	8.583	7.725	TOTAL	68085.7268	1141			
34	N	130	699	165	994	BETWEEN GROUPS	740.8054	2	370.4027	6.3268	0.0106
	M	21.923	23.498	25.097	23.557	WITHIN GROUPS	58018.4260	991	58.5453		
	SD	6.881	7.556	8.576	7.692	TOTAL	58759.2314	993			
35	N	98	545	127	770	BETWEEN GROUPS	489.3139	2	244.6569	5.0221	0.0103
	M	23.796	24.571	26.488	24.788	WITHIN GROUPS	37365.1809	767	48.7160		
	SD	6.974	6.896	7.334	7.016	TOTAL	37854.4948	769			
36	N	79	461	116	656	BETWEEN GROUPS	540.9272	2	270.4636	6.1771	0.0155
	M	25.734	27.505	29.103	27.575	WITHIN GROUPS	28591.4128	653	43.7847		
	SD	6.652	6.513	6.996	6.669	TOTAL	29132.3399	655			

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14D:  COMBINED SAMPLES -Low IQ

J              1         2         3          TOTAL         SOURCE           SUM OF SQUARES    DF        MEAN SQUARE    F RATIO      OMEGA SQ

       N      189       925       203         1317      BETWEEN GROUPS         8820.7362      2        4410.3681      35.7799       0.0502
37     M   83.794    88.618    93.286       88.645      WITHIN GROUPS        161968.6685   1314         123.2638
       SD   9.467    11.127    12.330       11.392      TOTAL                170789.4047   1316

       N      111       622       140          873      BETWEEN GROUPS         3385.6210      2        1692.8105      13.7616       0.0284
38     M   89.640    92.249    96.686       92.629      WITHIN GROUPS        107018.1316    870         123.0093
       SD  10.187    10.986    12.190       11.252      TOTAL                110403.7526    872

       N       58       390        97          545      BETWEEN GROUPS            1.5766      2           0.7883       0.4579      -0.0020
39     M    3.362     3.200     3.165        3.211      WITHIN GROUPS           933.1574    542           1.7217
       SD   1.280     1.315     1.320        1.311      TOTAL                   934.7339    544

       N      171       874       194         1239      BETWEEN GROUPS        17596.7634      2        8798.3817      50.1224       0.0735
40     M   46.977    52.025    60.433       52.645      WITHIN GROUPS        216964.9815   1236         175.5380
       SD  11.735    13.060    15.212       13.765      TOTAL                234561.7450   1238

       N      180       882       196         1258      BETWEEN GROUPS        16016.4876      2        8008.2438      47.2155       0.0684
41     M   44.789    51.734    57.852       51.693      WITHIN GROUPS        212861.0736   1255         169.6104
       SD  10.295    12.938    15.427       13.494      TOTAL                228877.5612   1257

       N      156       804       187         1147      BETWEEN GROUPS        17395.2526      2        8697.6263      29.2104       0.0469
42     M   37.936    44.994    52.187       45.207      WITHIN GROUPS        340634.7771   1144         297.7577
       SD  15.545    17.005    19.535       17.675      TOTAL                358030.0296   1146

       N      179       859       191         1229      BETWEEN GROUPS         2579.4980      2        1289.7490      12.8943       0.0190
43     M   54.128    56.239    59.325       56.411      WITHIN GROUPS        122629.9959   1226         100.0245
       SD   9.473     9.810    11.259       10.098      TOTAL                125209.4939   1228

       N      161       827       189         1177      BETWEEN GROUPS        10709.8816      2        5354.9408      47.3120       0.0730
44     M   47.739    52.255    58.603       52.657      WITHIN GROUPS        132877.4472   1174         113.1835
       SD   9.486    10.346    12.645       11.050      TOTAL                143587.3288   1176

       N       96       483       119          698      BETWEEN GROUPS         6424.6383      2        3212.3192       7.4960       0.0183
45     M   70.917    75.745    81.739       76.103      WITHIN GROUPS        297831.9347    695         428.5352
       SD  20.297    20.302    22.556       20.893      TOTAL                304256.5731    697

       N       95       482       119          696      BETWEEN GROUPS        16497.2379      2        8248.6189      21.2918       0.0551
46     M   70.905    78.568    88.261       79.180      WITHIN GROUPS        268473.3124    693         387.4074
       SD  20.643    19.194    20.832       20.249      TOTAL                284970.5503    695

       N       95       483       119          697      BETWEEN GROUPS        11052.9340      2        5526.4670      15.9200       0.0411
47     M   70.842    77.004    85.017       77.532      WITHIN GROUPS        240914.5897    694         347.1392
       SD  19.325    18.062    20.287       19.027      TOTAL                251967.5237    696

       N      132       697       157          986      BETWEEN GROUPS          450.5559      2         225.2780      12.7504       0.0233
48     M    7.818     8.901    10.287        8.977      WITHIN GROUPS         17367.9076    983          17.6683
       SD   4.028     4.219     4.279        4.253      TOTAL                 17818.4635    985
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LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14D: COMBINED SAMPLES -Low IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	129	696	161	986	BETWEEN GROUPS	529.2617	2	264.6309	10.9397	0.0198
49	M	8.496	9.418	11.075	9.568	WITHIN GROUPS	23778.6855	983	24.1899		
	SD	4.654	4.847	5.409	4.968	TOTAL	24307.9473	985			
	N	131	696	163	990	BETWEEN GROUPS	345.9572	2	172.9786	10.6078	0.0190
50	M	8.511	9.688	10.693	9.698	WITHIN GROUPS	16094.7388	987	16.3067		
	SD	3.941	3.998	4.279	4.077	TOTAL	16440.6960	989			
	N	131	692	160	983	BETWEEN GROUPS	221.8908	2	110.9454	5.1222	0.0083
51	M	8.496	9.116	10.175	9.205	WITHIN GROUPS	21226.5995	980	21.6598		
	SD	4.077	4.623	5.197	4.674	TOTAL	21448.4903	982			
	N	129	690	157	976	BETWEEN GROUPS	556.6541	2	278.3271	17.2890	0.0323
52	M	8.411	9.510	11.134	9.626	WITHIN GROUPS	15663.8449	973	16.0985		
	SD	3.878	3.829	4.828	4.079	TOTAL	16220.4990	975			
	N	129	698	160	987	BETWEEN GROUPS	635.6650	2	317.8325	15.7608	0.0290
53	M	7.380	8.504	10.256	8.641	WITHIN GROUPS	19843.3685	984	20.1660		
	SD	4.267	4.376	5.119	4.557	TOTAL	20479.0334	986			
	N	132	689	158	979	BETWEEN GROUPS	888.5240	2	444.2620	23.9980	0.0449
54	M	6.038	7.753	9.538	7.810	WITHIN GROUPS	18068.1379	976	18.5124		
	SD	3.877	4.209	4.991	4.403	TOTAL	18956.6619	978			
	N	134	685	164	983	BETWEEN GROUPS	626.0766	2	313.0383	16.8831	0.0313
55	M	8.015	9.149	10.841	9.277	WITHIN GROUPS	18170.6599	980	18.5415		
	SD	4.370	4.262	4.436	4.375	TOTAL	18796.7365	982			
	N	131	680	158	969	BETWEEN GROUPS	424.0661	2	212.0330	11.2644	0.0207
56	M	8.282	9.312	10.671	9.394	WITHIN GROUPS	18183.3416	966	18.8233		
	SD	4.443	4.169	4.929	4.384	TOTAL	18607.4076	968			
	N	217	1042	235	1494	BETWEEN GROUPS	75221.2234	2	37610.6117	1944.0076	0.7223
57	M	87.585	99.696	113.319	100.080	WITHIN GROUPS	28846.2981	1491	19.3469		
	SD	3.585	4.493	4.649	8.349	TOTAL	104067.5214	1493			

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A:  WHITE MALES

NO OF VARIABLES =  57     CLASSIFICATION VAR = # 57      WITH ELIMINATION CODE FOR CLAS. VAR =    999.000

CLAS CATEGORY UPPER LIMITS =   91.000, 108.000, 990.000,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,

RESTRICTION VAR = #  0      WITH RANGE OF     0.0    TO     0.0

CODES TO BE EXCLUDED FOR VARS 1 TO  57 ARE     0.0  ,   0.0  ,   0.0  ,  -9.000,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,  1.000,    0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,  999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM =  1696  DATA TO BE READ FROM  TAPE WITHOUT REWIND
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GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

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          LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

          LLOYD 1-14A:  WHITE MALES

J            1         2         3        TOTAL        SOURCE          SUM OF SQUARES    DF      MEAN SQUARE     F RATIO      OMEGA SQ

    N      248       1105       271      1624     BETWEEN GROUPS          988.1333      2         494.0667     11.4009       0.0126
1   M  139.246    140.131   141.886   140.289     WITHIN GROUPS         70247.4227   1621          43.3359
    SD   5.979      6.481     7.464     6.625     TOTAL                 71235.5560   1623

    N      235       1056       256      1547     BETWEEN GROUPS           27.9594      2          13.9797      4.6173       0.0047
2   M    3.881      3.586     3.410     3.602     WITHIN GROUPS          4674.7556   1544           3.0277
    SD   1.680      1.747     1.765     1.744     TOTAL                  4702.7149   1546

    N      234       1060       255      1549     BETWEEN GROUPS            9.4179      2           4.7089      1.9643       0.0012
3   M    3.829      3.640     3.565     3.656     WITHIN GROUPS          3706.1806   1546           2.3973
    SD   1.484      1.578     1.478     1.549     TOTAL                  3715.5985   1548

    N      248       1105       271      1624     BETWEEN GROUPS           22.5016      2          11.2508      3.8982       0.0036
4   M    2.161      2.030     1.764     2.006     WITHIN GROUPS          4678.4485   1621           2.8861
    SD   1.797      1.742     1.402     1.702     TOTAL                  4700.9501   1623

    N      226       1040       252      1518     BETWEEN GROUPS           19.7984      2           9.8992      4.0366       0.0040
5   M    4.292      4.155     3.901     4.133     WITHIN GROUPS          3715.3215   1515           2.4524
    SD   1.453      1.572     1.639     1.569     TOTAL                  3735.1199   1517

    N      235       1046       252      1533     BETWEEN GROUPS           11.5540      2           5.7770      4.3561       0.0044
6   M    3.391      3.228     3.083     3.229     WITHIN GROUPS          2029.0800   1530           1.3262
    SD   1.098      1.149     1.210     1.154     TOTAL                  2040.6341   1532

    N      229       1022       247      1498     BETWEEN GROUPS         2137.2587      2        1068.6293     44.3720       0.0547
7   M   16.659     19.149    20.870    19.052     WITHIN GROUPS         36004.6799   1495          24.0834
    SD   4.830      4.903     4.995     5.048     TOTAL                 38141.9386   1497

    N      248       1105       271      1624     BETWEEN GROUPS          352.4818      2         176.2409      0.6273      -0.0005
8   M  103.427    103.475   102.218   103.258     WITHIN GROUPS        455412.4141   1621         280.9454
    SD  14.911     16.717    18.457    16.758     TOTAL                455764.8959   1623

    N      123        576       130       829     BETWEEN GROUPS            8.4154      2           4.2077      2.2852       0.0031
9   M    2.854      2.946     3.192     2.971     WITHIN GROUPS          1520.8898    826           1.8413
    SD   1.199      1.370     1.436     1.359     TOTAL                  1529.3052    828

    N      138        645       143       926     BETWEEN GROUPS            3.4270      2           1.7135      1.0672       0.0001
10  M    2.522      2.594     2.734     2.605     WITHIN GROUPS          1481.9121    923           1.6055
    SD   1.185      1.278     1.294     1.267     TOTAL                  1485.3391    925

    N      163        734       166      1063     BETWEEN GROUPS            2.1160      2           1.0580      0.7378      -0.0005
11  M    2.767      2.654     2.729     2.683     WITHIN GROUPS          1520.0459   1060           1.4340
    SD   1.205      1.176     1.281     1.197     TOTAL                  1522.1618   1062

    N      179        820       182      1181     BETWEEN GROUPS            1.2554      2           0.6277      0.4112      -0.0010
12  M    2.391      2.315     2.379     2.336     WITHIN GROUPS          1798.2907   1178           1.5266
    SD   1.304      1.221     1.232     1.235     TOTAL                  1799.5461   1180
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          LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

          LLOYD 1-14A:  WHITE MALES

 J          1        2        3      TOTAL          SOURCE          SUM OF SQUARES    DF        MEAN SQUARE     F RATIO       OMEGA SQ

     N     154      714      161     1029     BETWEEN GROUPS          7235.6045        2        3617.8022      43.8964        0.0770
13   M   32.273   37.643   41.826   37.494    WITHIN GROUPS          84559.6045     1026          82.4168
     SD   9.229    9.125    8.720    9.450    TOTAL                  91795.2089     1028

     N     248     1105      271     1624     BETWEEN GROUPS        102266.2003        2       51133.1001     116.5679        0.1246
14   M   41.169   56.483   69.251   56.275    WITHIN GROUPS         711059.7646     1621         438.6550
     SD  13.405   23.086   17.030   22.386    TOTAL                 813325.9649     1623

     N     192      862      200     1254     BETWEEN GROUPS             2.0543        2           1.0272       4.7213        0.0059
15   M    2.646    2.711    2.790    2.714    WITHIN GROUPS            272.1698     1251           0.2176
     SD   0.490    0.471    0.420    0.468    TOTAL                    274.2241     1253

     N     248     1102      271     1621     BETWEEN GROUPS         60946.7428        2       30473.3714     162.5090        0.1662
16   M   49.895   60.051   71.509   60.413    WITHIN GROUPS         303404.1554     1618         187.5180
     SD  11.805   13.354   16.404   14.997    TOTAL                 364350.8982     1620

     N     158      744      173     1075     BETWEEN GROUPS          2888.3285        2        1444.1643       5.5147        0.0083
17   M  105.392  108.700  111.295  108.632    WITHIN GROUPS         280729.7962     1072         261.8748
     SD  15.636   16.313   16.107   16.250    TOTAL                 283618.1247     1074

     N     248     1105      271     1624     BETWEEN GROUPS         86788.2115        2       43394.1057     230.6281        0.2205
18   M   44.306   57.468   70.188   57.581    WITHIN GROUPS         305001.2214     1621         188.1562
     SD  11.543   13.767   15.257   15.537    TOTAL                 391789.4329     1623

     N     248     1093      267     1608     BETWEEN GROUPS          6101.0160        2        3050.5080      41.7712        0.0483
19   M   56.702   60.800   63.528   60.621    WITHIN GROUPS         117211.5785     1605          73.0290
     SD   8.184    8.547    8.862    8.760    TOTAL                 123312.5945     1607

     N     245     1088      269     1602     BETWEEN GROUPS         13223.4285        2        6611.7143      65.7972        0.0748
20   M   53.192   59.068   63.301   58.880    WITHIN GROUPS         160677.5603     1599         100.4863
     SD   9.805   10.091    9.950   10.422    TOTAL                 173900.9888     1601

     N     224     1007      237     1468     BETWEEN GROUPS          5920.4837        2        2960.2418      38.4564        0.0486
21   M   23.893   27.827   31.051   27.747    WITHIN GROUPS         112770.7554     1465          76.9766
     SD   6.799    8.988    9.478    8.995    TOTAL                 118691.2391     1467

     N     224     1008      237     1469     BETWEEN GROUPS          5791.7496        2        2895.8748      34.4272        0.0435
22   M   25.040   28.607   32.131   28.632    WITHIN GROUPS         123314.0121     1466          84.1160
     SD   7.641    9.299    9.918    9.378    TOTAL                 129105.7617     1468

     N     188      881      208     1277     BETWEEN GROUPS          2469.0288        2        1234.5144      13.4351        0.0191
23   M   24.447   27.061   29.447   27.065    WITHIN GROUPS         117064.5765     1274          91.8874
     SD   8.340    9.612   10.485    9.679    TOTAL                 119533.6053     1276

     N     224     1007      237     1468     BETWEEN GROUPS          5379.3459        2        2689.6730      30.9321        0.0392
24   M   23.991   27.865   30.797   27.747    WITHIN GROUPS         127387.8932     1465          86.9542
     SD   7.672    9.501    9.968    9.513    TOTAL                 132767.2391     1467
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          LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

          LLOYD 1-14A:  WHITE MALES

J              1          2          3         TOTAL        SOURCE          SUM OF SQUARES   DF         MEAN SQUARE    F RATIO       OMEGA SQ

      N       89        428        109          626     BETWEEN GROUPS          972.0527      2           486.0264      4.4380        0.0109
25    M   23.236     25.769     27.688       25.743     WITHIN GROUPS         68227.5399    623           109.5145
      SD   8.956     10.556     11.219       10.522     TOTAL                 69199.5927    625

      N      224       1004        235         1463     BETWEEN GROUPS         1540.2401      2           770.1200     10.8147        0.0132
26    M   30.750     32.553     34.413       32.576     WITHIN GROUPS        103967.1639   1460            71.2104
      SD   7.184      8.593      8.869        8.495     TOTAL                105507.4040   1462

      N       78        472        125          675     BETWEEN GROUPS         2545.6205      2          1272.8102      8.5552        0.0219
27    M   20.372     25.292     27.608       25.153     WITHIN GROUPS         99977.6625    672           148.7763
      SD  10.111     12.475     12.315       12.333     TOTAL                102523.2830    674

      N      222        990        233         1445     BETWEEN GROUPS         2909.8654      2          1454.9327     15.7966        0.0201
28    M   30.815     34.169     35.665       33.895     WITHIN GROUPS        132814.1456   1442            92.1041
      SD   9.043      9.662      9.830        9.695     TOTAL                135724.0111   1444

      N      210        932        210         1352     BETWEEN GROUPS          870.3222      2           435.1611      5.1155        0.0061
29    M   29.400     31.231     32.186       31.095     WITHIN GROUPS        114755.5595   1349            85.0671
      SD   8.752      9.382      8.965        9.251     TOTAL                115625.8817   1351

      N      223       1002        235         1460     BETWEEN GROUPS          456.7189      2           228.3594      4.0250        0.0041
30    M   37.381     38.384     39.379       38.391     WITHIN GROUPS         82662.9654   1457            56.7350
      SD   6.867      7.779      7.046        7.548     TOTAL                 83119.6842   1459

      N      225       1005        241         1471     BETWEEN GROUPS         7831.0159      2          3915.5079     40.7063        0.0512
31    M   25.684     30.404     33.846       30.246     WITHIN GROUPS        141205.8991   1468            96.1893
      SD   8.421     10.053      9.971       10.069     TOTAL                149036.9150   1470

      N      210        943        223         1376     BETWEEN GROUPS         6140.9250      2          3070.4625     29.7236        0.0401
32    M   25.895     29.785     33.430       29.782     WITHIN GROUPS        141831.6680   1373           103.3006
      SD   8.719     10.285     10.883       10.374     TOTAL                147972.5930   1375

      N      191        894        211         1296     BETWEEN GROUPS         2628.7927      2          1314.3963     14.9767        0.0211
33    M   26.387     29.365     31.483       29.271     WITHIN GROUPS        113477.1448   1293            87.7627
      SD   7.727      9.483     10.194        9.469     TOTAL                116105.9375   1295

      N      178        816        199         1193     BETWEEN GROUPS         2181.7651      2          1090.8825     11.6829        0.0176
34    M   24.157     26.635     28.975       26.655     WITHIN GROUPS        111115.6414   1190            93.3745
      SD   7.637      9.889     10.319        9.749     TOTAL                113297.4065   1192

      N      144        663        168          975     BETWEEN GROUPS         1140.3392      2           570.1696      7.8909        0.0139
35    M   25.229     27.585     29.030       27.486     WITHIN GROUPS         70233.2238    972            72.2564
      SD   7.270      8.591      9.095        8.560     TOTAL                 71373.5631    974

      N      124        598        156          878     BETWEEN GROUPS         1324.0364      2           662.0182     10.9898        0.0222
36    M   27.032     29.741     31.385       29.650     WITHIN GROUPS         52709.6185    875            60.2396
      SD   6.542      7.804      8.457        7.849     TOTAL                 54033.6549    877
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                  LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

                  LLOYD 1-14A:  WHITE MALBS

 J              1         2         3       TOTAL          SOURCE          SUM OF SQUARES    DF       MEAN SQUARE     F RATIO       OMEGA SQ

      N       221       984       228       1433     BETWEEN GROUPS       17696.2708        2         8848.1354     36.9834        0.0478
37    M    94.851   101.621   107.390    101.495     WITHIN GROUPS       342121.9399     1430          239.2461
      SD   13.729    15.538    16.703     15.851     TOTAL               359818.2107     1432

      N       156       717       178       1051     BETWEEN GROUPS        8443.2992        2         4221.6496     19.2780        0.0336
38    M   100.083   107.232   109.489    106.587     WITHIN GROUPS       229499.4849     1048          218.9881
      SD   14.110    14.738    15.610     15.054     TOTAL               237942.7840     1050

      N        85       434       112        631     BETWEEN GROUPS           3.5342        2            1.7671      1.1058        0.0003
39    M     2.835     2.641     2.768      2.689     WITHIN GROUPS         1003.5847      628            1.5981
      SD    1.174     1.289     1.230      1.264     TOTAL                 1007.1189      630

      N       210       956       231       1397     BETWEEN GROUPS       47164.2005        2        23582.1003     54.7677        0.0715
40    M    58.067    68.417    78.758     68.571     WITHIN GROUPS       600233.9627     1394          430.5839
      SD   18.102    20.861    22.473     21.535     TOTAL               647398.1632     1396

      N       216       963       232       1411     BETWEEN GROUPS       21608.2673        2        10804.1336     36.3013        0.0477
41    M    52.977    60.787    66.836     60.586     WITHIN GROUPS       419054.0205     1408          297.6236
      SD   14.718    17.534    18.223     17.678     TOTAL               440662.2877     1410

      N       196       921       228       1345     BETWEEN GROUPS       39009.9207        2        19504.9603     35.4862        0.0488
42    M    47.903    59.119    67.083     58.835     WITHIN GROUPS       737629.4369     1342          549.6494
      SD   19.706    23.639    25.516     24.039     TOTAL               776639.3576     1344

      N       215       956       228       1399     BETWEEN GROUPS        8915.0368        2         4457.5184     24.1561        0.0320
43    M    61.553    67.027    70.399     66.736     WITHIN GROUPS       257603.1076     1396          184.5294
      SD   11.744    13.815    14.207     13.807     TOTAL               266518.1444     1398

      N       201       911       224       1336     BETWEEN GROUPS       23281.3776        2        11640.6888     44.0756        0.0606
44    M    57.025    65.226    71.835     65.100     WITHIN GROUPS       352055.1822     1333          264.1074
      SD   13.523    16.553    17.223     16.768     TOTAL               375336.5599     1335

      N       139       652       154        945     BETWEEN GROUPS       15912.7585        2         7956.3793     16.2188        0.0312
45    M    85.683    95.121   100.117     94.547     WITHIN GROUPS       462113.3960      942          490.5662
      SD   23.513    21.986    21.562     22.503     TOTAL               478026.1545      944

      N       138       651       154        943     BETWEEN GROUPS       27919.1184        2        13959.5592     31.7451        0.0612
46    M    85.391    97.504   104.714     96.909     WITHIN GROUPS       413355.0385      940          439.7394
      SD   23.664    20.791    19.072     21.644     TOTAL               441274.1569      942

      N       138       652       154        944     BETWEEN GROUPS       21243.2357        2        10621.6178     25.3188        0.0490
47    M    85.580    96.184   102.422     95.651     WITHIN GROUPS       394763.1022      941          419.5145
      SD   22.336    20.347    19.285     21.004     TOTAL               416006.3379      943

      N       163       771       177       1111     BETWEEN GROUPS        1323.1613        2          661.5807     21.4084        0.0354
48    M    10.926    13.450    14.780     13.292     WITHIN GROUPS        34240.3508     1108           30.9028
      SD    5.426     5.537     5.774      5.660     TOTAL                35563.5122     1110
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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A:  WHITE MALES

 J            1          2          3       TOTAL          SOURCE          SUM OF SQUARES    DF          MEAN SQUARE    F RATIO        OMEGA SQ

      N      164        760        176       1100     BETWEEN GROUPS          945.0978        2           472.5489     13.0951        0.0215
49    M    13.030     15.159     16.284     15.022     WITHIN GROUPS         39586.3785     1097            36.0860
      SD    6.144      5.928      6.214      6.073     TOTAL                 40531.4764     1099

      N      166        766        188       1120     BETWEEN GROUPS         1160.6220        2           580.3110     24.2861        0.0399
50    M    10.494     12.714     14.085     12.615     WITHIN GROUPS         26690.5200     1117            23.8948
      SD    4.215      4.896      5.383      4.989     TOTAL                 27851.1420     1119

      N      166        769        186       1121     BETWEEN GROUPS         1062.9479        2           531.4739     14.4682        0.0235
51    M    12.976     14.822     16.457     14.820     WITHIN GROUPS         41068.6525     1118            36.7340
      SD    5.430      6.117      6.354      6.133     TOTAL                 42131.6004     1120

      N      165        772        180       1117     BETWEEN GROUPS         1744.8569        2           872.4285     29.1070        0.0479
52    M    11.224     13.924     15.683     13.808     WITHIN GROUPS         33390.1440     1114            29.9732
      SD    5.034      5.455      5.927      5.611     TOTAL                 35135.0009     1116

      N      165        774        184       1123     BETWEEN GROUPS         1396.8227        2           698.4113     18.8555        0.0308
53    M    10.436     13.022     14.348     12.859     WITHIN GROUPS         41484.9476     1120            37.0401
      SD    5.660      6.034      6.645      6.182     TOTAL                 42881.7703     1122

      N      163        777        181       1121     BETWEEN GROUPS         1783.9981        2           891.9990     28.6489        0.0470
54    M     8.736     11.649     13.199     11.475     WITHIN GROUPS         34809.5773     1118            31.1356
      SD    5.289      5.471      6.259      5.716     TOTAL                 36593.5754     1120

      N      167        774        182       1123     BETWEEN GROUPS         1867.8676        2           933.9338     32.8263        0.0536
55    M    10.922     13.749     15.495     13.612     WITHIN GROUPS         31864.8572     1120            28.4508
      SD    4.960      5.345      5.610      5.483     TOTAL                 33732.7248     1122

      N      166        766        182       1114     BETWEEN GROUPS         1417.3516        2           708.6758     22.5339        0.0372
56    M    11.060     13.567     15.038     13.434     WITHIN GROUPS         34940.2328     1111            31.4494
      SD    5.700      5.517      5.896      5.715     TOTAL                 36357.5844     1113

      N      248       1105        271       1624     BETWEEN GROUPS        93510.8077        2         46755.4039   2261.4379        0.7357
57    M    86.766     99.882    113.598    100.168     WITHIN GROUPS         33514.3000     1621            20.6751
      SD    4.028      4.546      4.979      8.847     TOTAL                127025.1078     1623
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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A:  WHITE FEMALES

NO OF VARIABLES =  57     CLASSIFICATION VAR = # 57     WITH ELIMINATION CODE FOR CLAS. VAR =   999.000

CLAS CATEGORY UPPER LIMITS =   91.000, 108.000, 990.000,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,

RESTRICTION VAR = #  0     WITH RANGE OF     0.0    TO     0.0

CODES TO BE EXCLUDED FOR VARS 1 TO  57 ARE     0.0  ,    0.0  ,    0.0  ,  -9.000,    0.0  ,    0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,  1.000,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,  999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM =  1670  DATA TO BE READ FROM  TAPE WITHOUT REWIND
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GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A:  WHITE FEMALES

J            1          2          3       TOTAL         SOURCE           SUM OF SQUARES    DF        MEAN SQUARE     F RATIO        OMEGA SQ

    N      240       1116        244        1600   BETWEEN GROUPS          1125.3345       2          562.6673      20.0973         0.0233
1   M  137.329    138.802    140.377     138.821   WITHIN GROUPS          44711.5430    1597           27.9972
    SD   5.166      5.280      5.460       5.354   TOTAL                  45836.8775    1599

    N      231       1068        235        1534   BETWEEN GROUPS            98.4637       2           49.2318      16.6334         0.0200
2   M    4.052      3.684      3.145       3.656   WITHIN GROUPS           4531.4874    1531            2.9598
    SD   1.646      1.709      1.839       1.738   TOTAL                   4629.9511    1533

    N      231       1073        236        1540   BETWEEN GROUPS            24.7846       2           12.3923       5.2660         0.0055
3   M    3.931      3.709      3.470       3.706   WITHIN GROUPS           3616.9628    1537            2.3533
    SD   1.485      1.546      1.525       1.538   TOTAL                   3641.7474    1539

    N      240       1116        244        1600   BETWEEN GROUPS             7.1465       2            3.5732       1.2844         0.0004
4   M    2.129      2.056      1.898       2.043   WITHIN GROUPS           4442.8779    1597            2.7820
    SD   1.625      1.735      1.371       1.668   TOTAL                   4450.0244    1599

    N      229       1048        233        1510   BETWEEN GROUPS            70.8532       2           35.4266      15.4718         0.0188
5   M    4.489      4.158      3.712       4.140   WITHIN GROUPS           3450.6627    1507            2.2898
    SD   1.416      1.511      1.610       1.528   TOTAL                   3521.5159    1509

    N      228       1061        235        1524   BETWEEN GROUPS            44.8174       2           22.4087      17.8771         0.0217
6   M    3.482      3.260      2.877       3.234   WITHIN GROUPS           1906.5547    1521            1.2535
    SD   1.022      1.120      1.204       1.132   TOTAL                   1951.3720    1523

    N      228       1046        231        1505   BETWEEN GROUPS          2507.2801       2         1253.6400      55.7434         0.0678
7   M   18.399     20.760     23.074      20.757   WITHIN GROUPS          33779.1983    1502           22.4895
    SD   5.159      4.653      4.717       4.912   TOTAL                  36286.4784    1504

    N      240       1116        244        1600   BETWEEN GROUPS            60.5366       2           30.2683       0.1319        -0.0011
8   M  106.075    105.552    105.467     105.617   WITHIN GROUPS         366469.3734    1597          229.4736
    SD  14.201     14.778     17.541      15.140   TOTAL                 366529.9100    1599

    N      125        581        114         820   BETWEEN GROUPS             8.0705       2            4.0353       2.1431         0.0028
9   M    2.832      3.107      3.114       3.066   WITHIN GROUPS           1538.3734     817            1.8830
    SD   1.230      1.414      1.302       1.374   TOTAL                   1546.4439     819

    N      137        655        134         926   BETWEEN GROUPS             3.3018       2            1.6509       0.9668        -0.0001
10  M    2.708      2.756      2.910       2.771   WITHIN GROUPS           1576.1626     923            1.7077
    SD   1.208      1.322      1.329       1.307   TOTAL                   1579.4644     925

    N      157        756        153        1066   BETWEEN GROUPS             5.8756       2            2.9378       1.7703         0.0014
11  M    2.790      2.856      3.046       2.873   WITHIN GROUPS           1764.0278    1063            1.6595
    SD   1.149      1.310      1.315       1.289   TOTAL                   1769.9034    1065

    N      179        830        173        1182   BETWEEN GROUPS             1.0827       2            0.5414       0.3707        -0.0011
12  M    2.346      2.431      2.405       2.415   WITHIN GROUPS           1721.7870    1179            1.4604
    SD   1.182      1.205      1.252       1.208   TOTAL                   1722.8697    1181
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         LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

         LLOYD 1-14A:  WHITE FEMALES

 J          1        2        3        TOTAL        SOURCE        SUM OF SQUARES   DF       MEAN SQUARE    F RATIO       OMEGA SQ

     N     142      694      129        965    BETWEEN GROUPS       5146.8149       2      2573.4075     39.0240        0.0730
13   M   36.563   41.039   45.271     40.946   WITHIN GROUPS       63438.3830     962        65.9443
     SD   8.918    8.094    7.299      8.435   TOTAL               68585.1979     964

     N     240     1116      244       1600    BETWEEN GROUPS      85046.4991       2     42523.2496    136.2511        0.1446
14   M   48.008   61.296   74.520     61.319   WITHIN GROUPS      498415.3002    1597       312.0947
     SD  26.779   15.678   14.763     19.102   TOTAL              583461.7994    1599

     N     194      867      173       1234    BETWEEN GROUPS          1.0878       2         0.5439      3.2203        0.0036
15   M    2.773    2.806    2.879      2.811   WITHIN GROUPS         207.9179    1231         0.1689
     SD   0.444    0.410    0.377      0.412   TOTAL                 209.0057    1233

     N     240     1116      243       1599    BETWEEN GROUPS      57844.2941       2     28922.1471    163.5015        0.1689
16   M   55.179   63.617   76.700     64.339   WITHIN GROUPS      282319.9886    1596       176.8922
     SD  16.956   11.849   15.355     14.590   TOTAL              340164.2827    1598

     N     147      733      143       1023    BETWEEN GROUPS       3849.2529       2      1924.6265      8.0810        0.0137
17   M  105.537  108.274  112.699    108.500   WITHIN GROUPS      242930.4968    1020       238.1672
     SD  15.767   15.279   15.867     15.539   TOTAL              246779.7498    1022

     N     240     1116      244       1600    BETWEEN GROUPS      83158.8284       2     41579.4142    302.0223        0.2734
18   M   49.246   61.911   75.447     62.076   WITHIN GROUPS      219859.0210    1597       137.6700
     SD  10.716   11.511   13.560     13.766   TOTAL              303017.8494    1599

     N     234     1103      244       1581    BETWEEN GROUPS       4582.5928       2      2291.2964     41.1585        0.0483
19   M   58.833   62.165   65.020.    62.113   WITHIN GROUPS       87847.3667    1578        55.6701
     SD   7.946    7.315    7.636      7.649   TOTAL               92429.9595    1580

     N     235     1096      239       1570    BETWEEN GROUPS      11384.0980       2      5692.0490     69.6847        0.0805
20   M   58.898   64.514   68.628     64.299   WITHIN GROUPS      127997.2014    1567        81.6830
     SD   9.555    8.942    8.953      9.425   TOTAL              139381.2994    1569

     N     224     1013      213       1450    BETWEEN GROUPS       5415.0074       2      2707.5037     35.3770        0.0453
21   M   30.143   33.328   37.174     33.401   WITHIN GROUPS      110743.1919    1447        76.5330
     SD   8.415    8.815    8.772      8.953   TOTAL              116158.1993    1449

     N     224     1013      213       1450    BETWEEN GROUPS       6072.6212       2      3036.3106     38.1718        0.0488
22   M   29.969   33.174   37.394     33.299   WITHIN GROUPS      115099.0760    1447        79.5432
     SD   8.594    8.998    8.872      9.145   TOTAL              121171.6972    1449

     N     201      912      187       1300    BETWEEN GROUPS       3926.3861       2      1963.1931     22.2594        0.0317
23   M   27.891   30.596   34.230     30.701   WITHIN GROUPS      114390.2131    1297        88.1960
     SD   8.287    9.599    9.479      9.544   TOTAL              118316.5992    1299

     N     224     1013      213       1450    BETWEEN GROUPS       2833.5523       2      1416.7762     16.8150        0.0213
24   M   29.817   31.862   34.864     31.987   WITHIN GROUPS      121919.1987    1447        84.2565
     SD   8.782    9.198    9.491      9.279   TOTAL              124752.7510    1449
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          LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

          LLOYD 1-14A:  WHITE FEMALES

 J          1        2        3      TOTAL        SOURCE        SUM OF SQUARES    DF      MEAN SQUARE    F RATIO      OMEGA SQ

    N      159      746      139      1044   BETWEEN GROUPS        1207.3457       2       603.6729      5.4035      0.0084
25  M   28.698   29.713   32.518    29.932   WITHIN GROUPS       116298.8257    1041       111.7184
    SD   9.089   10.658   11.614    10.614   TOTAL               117506.1715    1043

    N      221     1007      213      1441   BETWEEN GROUPS        2772.7984       2      1386.3992     19.7430      0.0254
26  M   33.602   35.888   38.648    35.945   WITHIN GROUPS       100979.8706    1438        70.2224
    SD   8.024    8.456    8.379     8.488   TOTAL               103752.6690    1440

    N       64      391      102       557   BETWEEN GROUPS        3334.5988       2      1667.2994     12.6733      0.0402
27  M   27.797   31.974   36.725    32.364   WITHIN GROUPS        72884.4173     554       131.5603
    SD  11.416   11.505   11.367    11.708   TOTAL                76219.0162     556

    N      221     1001      209      1431   BETWEEN GROUPS        2252.4211       2      1126.2105     19.5755      0.0253
28  M   38.240   40.517   42.818    40.502   WITHIN GROUPS        82155.3246    1428        57.5317
    SD   7.792    7.572    7.426     7.683   TOTAL                84407.7456    1430

    N      213      935      201      1349   BETWEEN GROUPS        1566.0250       2       783.0125     12.3763      0.0166
29  M   35.826   37.580   39.711    37.620   WITHIN GROUPS        85157.6504    1346        63.2672
    SD   7.996    7.979    7.790     8.021   TOTAL                86723.6753    1348

    N      222     1006      210      1438   BETWEEN GROUPS         976.5839       2       488.2920      8.1968      0.0099
30  M   36.559   38.037   39.567    38.032   WITHIN GROUPS        85483.9446    1435        59.5707
    SD   7.461    7.758    7.793     7.757   TOTAL                86460.5285    1437

    N      225     1013      212      1450   BETWEEN GROUPS        7534.1635       2      3767.0817     40.4852      0.0516
31  M   31.467   35.415   39.774    35.439   WITHIN GROUPS       134640.9958    1447        93.0484
    SD   9.758    9.678    9.371     9.906   TOTAL               142175.1593    1449

    N      211      957      204      1372   BETWEEN GROUPS        5685.4738       2      2842.7369     28.7779      0.0389
32  M   30.848   34.231   38.240    34.307   WITHIN GROUPS       135232.3418    1369        98.7818
    SD   9.364    9.949   10.454    10.138   TOTAL               140917.8156    1371

    N      200      918      192      1310   BETWEEN GROUPS        3540.4146       2      1770.2073     21.2858      0.0300
33  M   30.515   33.235   36.516    33.301   WITHIN GROUPS       108695.0846    1307        83.1638
    SD   8.042    9.258    9.496     9.260   TOTAL               112235.4992    1309

    N      190      864      181      1235   BETWEEN GROUPS        3148.4106       2      1574.2053     18.1816      0.0271
34  M   28.237   30.318   33.945    30.530   WITHIN GROUPS       106669.2607    1232        86.5822
    SD   8.160    9.413    9.894     9.434   TOTAL               109817.6713    1234

    N      165      766      158      1089   BETWEEN GROUPS        2210.9740       2      1105.4870     13.9145      0.0232
35  M   29.218   31.087   34.342    31.276   WITHIN GROUPS        86280.8294    1086        79.4483
    SD   7.859    9.117    8.943     9.019   TOTAL                88491.8035    1088

    N      147      694      146       987   BETWEEN GROUPS        1388.1419       2       694.0710     11.8333      0.0215
36  M   32.313   34.406   36.664    34.429   WITHIN GROUPS        57715.5723     984        58.6540
    SD   7.664    7.661    7.642     7.742   TOTAL                59103.7143     986
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          LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

          LLOYD 1-14A:  WHITE FEMALES

J          1         2         3        TOTAL        SOURCE          SUM OF SQUARES    DF       MEAN SQUARE    F RATIO      OMEGA SQ

    N     220      1005       215       1440   BETWEEN GROUPS      19022.3938      2       9511.1969    47.1826       0.0603
37  M   98.941   105.465   112.167   105.469   WITHIN GROUPS      289674.1999   1437        201.5826
    SD  13.609    14.036    15.485    14.647   TOTAL              308696.5937   1439

    N     171       778       155       1104   BETWEEN GROUPS       9659.8929      2       4829.9465    26.8462       0.0447
38  M  102.836   106.959   113.606   107.254   WITHIN GROUPS      198083.0926   1101        179.9120
    SD  12.525    13.382    14.478    13.724   TOTAL              207742.9855   1103

    N     110       537       117        764   BETWEEN GROUPS          1.4151      2          0.7076     0.4171      -0.0015
39  M    3.282     3.181     3.128     3.187   WITHIN GROUPS        1290.8191    761          1.6962
    SD   1.321     1.301     1.290     1.301   TOTAL                1292.2343    763

    N     212       989       209       1410   BETWEEN GROUPS      50595.7967      2      25297.8983    72.6193       0.0922
40  M   62.759    72.619    84.622    72.916   WITHIN GROUPS      490147.1601   1407        348.3633
    SD  16.413    18.789    20.155    19.590   TOTAL              540742.9567   1409

    N     219       993       211       1423   BETWEEN GROUPS      31948.6136      2      15974.3068    52.5312       0.0675
41  M   60.479    69.213    77.716    69.130   WITHIN GROUPS      431810.3351   1420        304.0918
    SD  16.167    17.251    19.470    18.059   TOTAL              463758.9487   1422

    N     209       982       208       1399   BETWEEN GROUPS      58790.8281      2      29395.4140    54.1289       0.0706
42  M   57.828    69.441    81.572    69.510   WITHIN GROUPS      758116.7917   1396        543.0636
    SD  21.685    23.464    24.099    24.173   TOTAL              816907.6197   1398

    N     211       977       207       1395   BETWEEN GROUPS       6366.6804      2       3183.3402    21.9297       0.0291
43  M   63.986    68.071    71.783    68.004   WITHIN GROUPS      202064.3017   1392        145.1611
    SD  10.911    11.993    13.344    12.228   TOTAL              208430.9821   1394

    N     202       953       205       1360   BETWEEN GROUPS      28424.5589      2      14212.2794    64.0271       0.0848
44  M   62.297    69.956    78.966    70.176   WITHIN GROUPS      301217.0882   1357        221.9728
    SD  13.370    14.704    17.072    15.574   TOTAL              329641.6471   1359

    N     161       740       151       1052   BETWEEN GROUPS      16848.5774      2       8424.2887    19.5742       0.0341
45  M   88.584    95.192   103.265    95.339   WITHIN GROUPS      451465.2733   1049        430.3768
    SD  20.472    20.382    20.359    21.109   TOTAL              468313.8508   1051

    N     160       740       151       1051   BETWEEN GROUPS      21959.3093      2      10979.6547    29.9382       0.0522
46  M   92.144    99.414   108.894    99.669   WITHIN GROUPS      384347.4633   1048        366.7438
    SD  19.656    19.429    17.118    19.671   TOTAL              406306.7726   1050

    N     161       740       151       1052   BETWEEN GROUPS      20150.9742      2      10075.4871    28.6586       0.0500
47  M   90.037    97.264   106.093    97.425   WITHIN GROUPS      368796.0932   1049        351.5692
    SD  18.992    18.893    17.759    19.237   TOTAL              388947.0675   1051

    N     183       832       169       1184   BETWEEN GROUPS       1451.5912      2        725.7956    28.3726       0.0442
48  M   10.344    12.155    14.402    12.196   WITHIN GROUPS       30210.9493   1181         25.5808
    SD   4.586     5.107     5.296     5.173   TOTAL               31662.5405   1183
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LLOYD I-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD I-14A: WHITE FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	177	828	166	1171	BETWEEN GROUPS	1778.6075	2	889.3037	30.4695	0.0479
49	M	10.480	12.830	15.030	12.787	WITHIN GROUPS	34090.0193	1168	29.1367		
	SD	5.067	5.482	5.350	5.537	TOTAL	35868.6268	1170			
	N	179	830	168	1177	BETWEEN GROUPS	1169.2541	2	584.6271	26.0537	0.0408
50	M	13.263	14.901	16.929	14.941	WITHIN GROUPS	26343.7009	1174	22.4393		
	SD	4.364	4.635	5.552	4.837	TOTAL	27512.9550	1176			
	N	181	826	166	1173	BETWEEN GROUPS	476.2745	2	238.1373	7.5839	0.0111
51	M	11.840	13.045	14.181	13.020	WITHIN GROUPS	36738.2745	1170	31.4002		
	SD	5.406	5.587	5.889	5.635	TOTAL	37214.5490	1172			
	N	180	819	169	1168	BETWEEN GROUPS	1562.9000	2	781.4500	31.0126	0.0489
52	M	11.783	13.822	16.018	13.825	WITHIN GROUPS	29355.4699	1165	25.1978		
	SD	4.686	4.967	5.585	5.147	TOTAL	30918.3699	1167			
	N	181	830	164	1175	BETWEEN GROUPS	1804.3501	2	902.1751	31.9238	0.0500
53	M	10.552	12.349	15.091	12.455	WITHIN GROUPS	33121.0541	1172	28.2603		
	SD	4.908	5.401	5.313	5.454	TOTAL	34925.4043	1174			
	N	182	822	165	1169	BETWEEN GROUPS	2060.3257	2	1030.1629	36.7357	0.0576
54	M	10.544	13.055	15.412	12.997	WITHIN GROUPS	32697.6606	1166	28.0426		
	SD	4.960	5.318	5.518	5.455	TOTAL	34757.9863	1168			
	N	184	820	168	1172	BETWEEN GROUPS	2047.1070	2	1023.5535	38.3096	0.0599
55	M	11.940	14.204	16.768	14.216	WITHIN GROUPS	31233.2778	1169	26.7179		
	SD	5.187	5.124	5.365	5.331	TOTAL	33280.3848	1171			
	N	181	818	164	1163	BETWEEN GROUPS	1939.0737	2	969.5369	31.8436	0.0504
56	M	12.171	14.240	16.909	14.294	WITHIN GROUPS	35318.3553	1160	30.4469		
	SD	5.005	5.512	6.059	5.662	TOTAL	37257.4291	1162			
	N	240	1116	244	1600	BETWEEN GROUPS	85906.5942	2	42953.2971	2031.4547	0.7174
57	M	86.892	99.901	113.529	100.028	WITHIN GROUPS	33767.1402	1597	21.1441		
	SD	4.898	4.537	4.573	8.651	TOTAL	119673.7344	1599			

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

NO OF VARIABLES =  57     CLASSIFICATION VAR = # 57     WITH ELIMINATION CODE FOR CLAS. VAR =   999.000

CLAS CATEGORY UPPER LIMITS =   91.000, 108.000, 990.000,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,

RESTRICTION VAR = #  0     WITH RANGE OF     0.0    TO     0.0

CODES TO BE EXCLUDED FOR VARS 1 TO  57 ARE     0.0  ,   0.0  ,   0.0  ,  -9.000,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   1.000,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
    0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  , 999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM =   296  DATA TO BE READ FROM  TAPE WITHOUT REWIND
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GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	27	168	36	231	BETWEEN GROUPS	282.4860	2	141.2430	1.0731	0.0006
1	M	144.815	145.935	148.667	146.229	WITHIN GROUPS	30010.3538	228	131.6244		
	SD	11.156	11.424	11.926	11.476	TOTAL	30292.8398	230			
	N	23	158	32	213	BETWEEN GROUPS	1.7850	2	0.8925	0.6690	-0.0031
2	M	5.565	5.297	5.219	5.315	WITHIN GROUPS	280.1399	210	1.3340		
	SD	0.843	1.181	1.211	1.153	TOTAL	281.9249	212			
	N	26	157	34	217	BETWEEN GROUPS	0.0636	2	0.0318	0.0222	-0.0091
3	M	5.077	5.076	5.029	5.069	WITHIN GROUPS	305.8995	214	1.4294		
	SD	1.017	1.217	1.218	1.190	TOTAL	305.9631	216			
	N	27	168	36	231	BETWEEN GROUPS	3.3074	2	1.6537	0.2204	-0.0068
4	M	4.407	4.720	4.861	4.706	WITHIN GROUPS	1710.6753	228	7.5030		
	SD	2.693	2.716	2.880	2.730	TOTAL	1713.9827	230			
	N	25	158	34	217	BETWEEN GROUPS	1.4950	2	0.7475	0.5623	-0.0041
5	M	5.720	5.975	5.882	5.931	WITHIN GROUPS	284.4681	214	1.3293		
	SD	0.843	1.167	1.274	1.151	TOTAL	285.9631	216			
	N	25	159	35	219	BETWEEN GROUPS	0.4977	2	0.2488	0.4549	-0.0050
6	M	4.480	4.503	4.371	4.479	WITHIN GROUPS	118.1599	216	0.5470		
	SD	0.586	0.762	0.731	0.738	TOTAL	118.6575	218			
	N	27	160	35	222	BETWEEN GROUPS	592.0375	2	296.0187	12.7272	0.0956
7	M	15.000	17.062	20.857	17.410	WITHIN GROUPS	5093.5607	219	23.2587		
	SD	4.385	4.671	5.750	5.072	TOTAL	5685.6982	221			
	N	27	168	36	231	BETWEEN GROUPS	96.4672	2	48.2336	0.1952	-0.0070
8	M	87.037	85.077	85.833	85.424	WITHIN GROUPS	56329.9570	228	247.0612		
	SD	12.744	15.569	18.226	15.663	TOTAL	56426.4242	230			
	N	19	118	26	163	BETWEEN GROUPS	4.2047	2	2.1023	0.8803	-0.0015
9	M	2.842	2.712	3.154	2.798	WITHIN GROUPS	382.1143	160	2.3882		
	SD	1.772	1.536	1.405	1.544	TOTAL	386.3190	162			
	N	23	123	25	171	BETWEEN GROUPS	1.7031	2	0.8515	0.3435	-0.0077
10	M	2.565	2.675	2.920	2.696	WITHIN GROUPS	416.4840	168	2.4791		
	SD	1.409	1.627	1.441	1.568	TOTAL	418.1871	170			
	N	24	135	28	187	BETWEEN GROUPS	1.5548	2	0.7774	0.4177	-0.0063
11	M	2.917	2.711	2.571	2.717	WITHIN GROUPS	342.4238	184	1.8610		
	SD	1.349	1.381	1.289	1.360	TOTAL	343.9786	186			
	N	23	145	29	197	BETWEEN GROUPS	6.6457	2	3.3229	1.3281	0.0033
12	M	2.913	2.469	2.862	2.579	WITHIN GROUPS	485.3847	194	2.5020		
	SD	2.021	1.500	1.597	1.584	TOTAL	492.0305	196			

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

J             1        2        3      TOTAL         SOURCE        SUM OF SQUARES    DF      MEAN SQUARE    F RATIO     OMEGA SQ

     N       18       99       21      138      BETWEEN GROUPS        385.0380        2       192.5190      2.8375       0.0259
13   M   28.333   31.444   34.619   31.522      WITHIN GROUPS        9159.3968      135        67.8474
     SD   7.926    8.407    7.632    8.347      TOTAL                9544.4348      137

     N       22      143       33      198      BETWEEN GROUPS      10157.1861        2      5078.5930     44.6524       0.3060
14   M   29.909   39.678   55.788   41.278      WITHIN GROUPS       22178.5361      195       113.7361
     SD   8.257   10.265   13.446   12.812      TOTAL               32335.7222      197

     N       22      149       30      201      BETWEEN GROUPS          0.4057        2         0.2029      0.8166      -0.0018
15   M    2.455    2.557    2.633    2.557      WITHIN GROUPS          49.1863      198         0.2484
     SD   0.510    0.498    0.490    0.498      TOTAL                  49.5920      200

     N       22      143       33      198      BETWEEN GROUPS       6413.7141        2      3206.8570     41.8878       0.2923
16   M   40.000   48.811   61.030   49.869      WITHIN GROUPS       14928.8718      195        76.5583
     SD   7.165    8.391   10.973   10.409      TOTAL               21342.5859      197

     N       15      105       23      143      BETWEEN GROUPS       1051.2012        2       525.6006      2.2645       0.0174
17   M   86.200   95.010   92.609   93.699      WITHIN GROUPS       32494.8687      140       232.1062
     SD  16.971   15.168   14.358   15.370      TOTAL               33546.0699      142

     N       27      168       36      231      BETWEEN GROUPS      11399.0278        2      5699.5139     72.8144       0.3834
18   M   31.667   43.214   58.139   44.190      WITHIN GROUPS       17846.5913      228        78.2745
     SD   6.923    8.762   10.393   11.276      TOTAL               29245.6190      230

     N       27      167       36      230      BETWEEN GROUPS       1413.1069        2       706.5534     12.8431       0.0934
19   M   48.407   51.503   57.333   52.052      WITHIN GROUPS       12488.2670      227        55.0144
     SD   6.091    7.277    8.838    7.791      TOTAL               13901.3739      229

     N       27      165       36      228      BETWEEN GROUPS       2186.8898        2      1093.4449     15.9707       0.1161
20   M   45.889   49.636   56.944   50.346      WITHIN GROUPS       15404.7374      225        68.4655
     SD   8.382    8.210    8.492    8.803      TOTAL               17591.6272      227

     N       24      157       33      214      BETWEEN GROUPS        307.2165        2       153.6083      3.3061       0.0211
21   M   22.292   24.261   26.848   24.439      WITHIN GROUPS        9803.4938      211        46.4621
     SD   5.179    6.839    7.686    6.890      TOTAL               10110.7103      213

     N       24      157       33      214      BETWEEN GROUPS        341.4382        2       170.7191      3.5610       0.0234
22   M   22.250   24.261   27.030   24.463      WITHIN GROUPS       10115.7627      211        47.9420
     SD   5.244    6.972    7.707    7.007      TOTAL               10457.2009      213

     N       21      142       30      193      BETWEEN GROUPS        326.5337        2       163.2668      2.9118       0.0194
23   M   21.524   23.915   26.567   24.067      WITHIN GROUPS       10653.5907      190        56.0715
     SD   6.226    7.445    8.435    7.562      TOTAL               10980.1244      192

     N       24      157       33      214      BETWEEN GROUPS        353.6838        2       176.8419      3.3041       0.0211
24   M   20.750   23.510   25.788   23.551      WITHIN GROUPS       11293.2508      211        53.5225
     SD   6.879    7.108    8.521    7.395      TOTAL               11646.9346      213
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LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
25	N	1	27	10	38	BETWEEN GROUPS	239.0491	2	119.5246	1.5376	0.0275
	M	30.000	25.111	30.700	26.711	WITHIN GROUPS	2720.7667	35	77.7362		
	SD	0.0	7.982	10.874	8.944	TOTAL	2959.8158	37			
26	N	24	155	33	212	BETWEEN GROUPS	244.7762	2	122.3881	3.8668	0.0263
	M	29.792	31.439	33.818	31.623	WITHIN GROUPS	6615.0352	209	31.6509		
	SD	4.934	5.787	5.294	5.702	TOTAL	6859.8113	211			
27	N	1	22	8	31	BETWEEN GROUPS	49.5605	2	24.7802	0.5063	-0.0329
	M	20.000	25.500	27.125	25.742	WITHIN GROUPS	1370.3750	28	48.9420		
	SD	0.0	6.682	7.864	6.880	TOTAL	1419.9355	30			
28	N	24	157	33	214	BETWEEN GROUPS	695.0329	2	347.5164	4.7701	0.0340
	M	24.708	28.459	31.758	28.547	WITHIN GROUPS	15371.9998	211	72.8531		
	SD	8.809	8.196	9.855	8.685	TOTAL	16067.0327	213			
29	N	23	156	33	212	BETWEEN GROUPS	149.1942	2	74.5971	1.2868	0.0027
	M	28.609	30.359	31.909	30.410	WITHIN GROUPS	12116.1030	209	57.9718		
	SD	8.452	7.425	7.903	7.624	TOTAL	12265.2972	211			
30	N	24	156	33	213	BETWEEN GROUPS	381.4796	2	190.7398	2.6774	0.0155
	M	28.917	30.686	33.818	30.972	WITHIN GROUPS	14960.3514	210	71.2398		
	SD	8.642	8.293	8.984	8.507	TOTAL	15341.8310	212			
31	N	23	158	33	214	BETWEEN GROUPS	649.0279	2	324.5139	4.9738	0.0358
	M	24.217	26.918	30.818	27.229	WITHIN GROUPS	13766.7525	211	65.2453		
	SD	6.179	8.080	9.146	8.227	TOTAL	14415.7804	213			
32	N	24	146	31	201	BETWEEN GROUPS	1053.7359	2	526.8679	7.8860	0.0641
	M	21.250	25.233	29.935	25.483	WITHIN GROUPS	13228.4532	198	66.8104		
	SD	8.274	7.713	10.046	8.450	TOTAL	14282.1891	200			
33	N	16	126	29	171	BETWEEN GROUPS	257.6139	2	128.8069	2.0947	0.0126
	M	22.875	24.833	27.517	25.105	WITHIN GROUPS	10330.4914	168	61.4910		
	SD	6.076	7.789	8.850	7.892	TOTAL	10588.1053	170			
34	N	12	111	25	148	BETWEEN GROUPS	229.8459	2	114.9229	2.3736	0.0182
	M	22.583	25.099	27.640	25.324	WITHIN GROUPS	7020.5866	145	48.4178		
	SD	5.632	6.625	8.765	7.023	TOTAL	7250.4324	147			
35	N	11	96	21	128	BETWEEN GROUPS	64.8335	2	32.4167	0.6068	-0.0062
	M	26.909	26.490	28.429	26.844	WITHIN GROUPS	6678.0415	125	53.4243		
	SD	6.204	7.442	7.180	7.287	TOTAL	6742.8750	127			
36	N	9	81	19	109	BETWEEN GROUPS	132.1849	2	66.0925	1.7215	0.0131
	M	25.444	26.753	29.368	27.101	WITHIN GROUPS	4069.7050	106	38.3934		
	SD	3.395	6.522	5.649	6.237	TOTAL	4201.8899	108			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
37	N	23	141	32	196	BETWEEN GROUPS	1172.8735	2	586.4367	4.5848	0.0353
	M	78.739	81.723	87.406	82.301	WITHIN GROUPS	24686.3663	193	127.9086		
	SD	10.984	11.040	12.659	11.516	TOTAL	25859.2398	195			
38	N	11	103	21	135	BETWEEN GROUPS	638.8812	2	319.4406	2.4731	0.0214
	M	82.364	85.913	90.952	86.407	WITHIN GROUPS	17049.7114	132	129.1645		
	SD	10.966	10.781	14.126	11.489	TOTAL	17688.5926	134			
39	N	8	72	18	98	BETWEEN GROUPS	7.0014	2	3.5007	1.7433	0.0149
	M	4.000	3.014	3.111	3.112	WITHIN GROUPS	190.7639	95	2.0080		
	SD	1.195	1.399	1.568	1.428	TOTAL	197.7653	97			
40	N	18	129	24	171	BETWEEN GROUPS	1495.4009	2	747.7005	6.1736	0.0571
	M	41.500	44.256	52.083	45.064	WITHIN GROUPS	20346.8915	168	121.1124		
	SD	8.719	11.058	12.165	11.335	TOTAL	21842.2924	170			
41	N	21	131	26	178	BETWEEN GROUPS	3113.8892	2	1556.9446	11.5958	0.1064
	M	43.619	46.916	57.923	48.135	WITHIN GROUPS	23496.8749	175	134.2679		
	SD	9.244	11.007	15.541	12.261	TOTAL	26610.7640	177			
42	N	17	109	24	150	BETWEEN GROUPS	1282.8288	2	641.4144	3.6923	0.0347
	M	36.294	40.284	46.958	40.900	WITHIN GROUPS	25536.6712	147	173.7189		
	SD	11.268	12.974	15.216	13.416	TOTAL	26819.5000	149			
43	N	20	129	23	172	BETWEEN GROUPS	797.1708	2	398.5854	4.4190	0.0382
	M	49.350	51.434	57.174	51.959	WITHIN GROUPS	15243.5443	169	90.1985		
	SD	8.549	9.100	12.164	9.685	TOTAL	16040.7151	171			
44	N	17	122	23	162	BETWEEN GROUPS	1336.7613	2	668.3806	9.0933	0.0908
	M	43.471	45.270	53.130	46.198	WITHIN GROUPS	11686.9178	159	73.5026		
	SD	7.811	8.080	11.303	8.994	TOTAL	13023.6790	161			
45	N	4	24	9	37	BETWEEN GROUPS	676.8442	2	338.4221	0.9760	-0.0013
	M	55.250	57.625	67.111	59.676	WITHIN GROUPS	11789.2639	34	346.7431		
	SD	15.714	18.731	19.297	18.609	TOTAL	12466.1081	36			
46	N	4	24	9	37	BETWEEN GROUPS	2409.4501	2	1204.7250	5.3600	0.1907
	M	58.500	55.792	74.889	60.730	WITHIN GROUPS	7641.8472	34	224.7602		
	SD	5.972	14.219	18.990	16.709	TOTAL	10051.2973	36			
47	N	4	24	9	37	BETWEEN GROUPS	1313.1167	2	656.5584	2.9119	0.0937
	M	57.000	56.875	70.778	60.270	WITHIN GROUPS	7666.1806	34	225.4759		
	SD	9.695	14.504	17.838	15.793	TOTAL	8979.2973	36			
48	N	14	113	27	154	BETWEEN GROUPS	44.6269	2	22.3134	1.5471	0.0071
	M	7.071	7.283	8.667	7.506	WITHIN GROUPS	2177.8666	151	14.4230		
	SD	4.514	3.577	4.297	3.811	TOTAL	2222.4935	153			

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

J              1         2         3      TOTAL          SOURCE        SUM OF SQUARES    DF         MEAN SQUARE     F RATIO       OMEGA SQ

      N       15       119        28       162     BETWEEN GROUPS        175.9836       2           87.9918       5.8761         0.0568
49    M    4.800     7.193     9.000     7.284     WITHIN GROUPS        2380.9546     159           14.9746
      SD   3.212     3.882     4.119     3.985     TOTAL                2556.9383     161

      N       15       119        29       163     BETWEEN GROUPS        120.6266       2           60.3133       3.9683         0.0351
50    M    6.333     7.076     9.172     7.380     WITHIN GROUPS        2431.7906     160           15.1987
      SD   2.582     3.902     4.400     3.969     TOTAL                2552.4172     162

      N       16       119        28       163     BETWEEN GROUPS          3.1280       2            1.5640       0.1289        -0.0108
51    M    6.562     6.857     6.536     6.773     WITHIN GROUPS        1941.4732     160           12.1342
      SD   3.741     3.518     3.168     3.465     TOTAL                1944.6012     162

      N       15       119        27       161     BETWEEN GROUPS        131.6487       2           65.8244       7.8756         0.0787
52    M    5.200     7.454     8.889     7.484     WITHIN GROUPS        1320.5625     158            8.3580
      SD   2.651     2.825     3.286     3.013     TOTAL                1452.2112     160

      N       15       119        27       161     BETWEEN GROUPS         72.1305       2           36.0653       2.1598         0.0142
53    M    5.533     6.983     8.222     7.056     WITHIN GROUPS        2638.3664     158           16.6985
      SD   4.291     4.030     4.228     4.116     TOTAL                2710.4969     160

      N       16       115        27       158     BETWEEN GROUPS         87.0083       2           43.5041       3.9120         0.0356
54    M    4.500     4.826     6.741     5.120     WITHIN GROUPS        1723.7069     155           11.1207
      SD   2.852     3.207     4.063     3.396     TOTAL                1810.7152     157

      N       16       114        29       159     BETWEEN GROUPS        154.3176       2           77.1588       5.9801         0.0590
55    M    4.375     6.544     8.207     6.629     WITHIN GROUPS        2012.7893     156           12.9025
      SD   2.895     3.555     4.048     3.703     TOTAL                2167.1069     158

      N       16       109        26       151     BETWEEN GROUPS          2.5052       2            1.2526       0.1062        -0.0120
56    M    6.437     6.312     6.654     6.384     WITHIN GROUPS        1745.2166     148           11.7920
      SD   3.705     3.352     3.610     3.413     TOTAL                1747.7219     150

      N       27       168        36       231     BETWEEN GROUPS      11768.5239       2         5884.2619     263.4124         0.6944
57    M   87.074    99.542   114.194   100.368     WITHIN GROUPS        5093.1991     228           22.3386
      SD   5.188     4.227     6.346     8.562     TOTAL               16861.7229     230
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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLJYD 1-14A: NEGRO FEMALES

NO OF VARIABLES =  57     CLASSIFICATION VAR = # 57      WITH ELIMINATION CODE FOR CLAS. VAR =   999.000

CLAS CATEGORY UPPER LIMITS =   91.000, 108.000, 990.000,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,

RESTRICTION VAR = #  0     WITH RANGE OF     0.0     TO     0.0

CODES TO BE EXCLUDED FOR VARS 1 TO  57 ARE     0.0  ,    0.0  ,    0.0  ,   -9.000,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,  1.000,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,
     0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,   0.0  ,  999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM =   259  DATA TO BE READ FROM  TAPE WITHOUT REWIND
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GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	21	148	27	196	BETWEEN GROUPS	337.4675	2	168.7338	1.5243	0.0053
1	M	144.762	142.264	145.667	143.000	WITHIN GROUPS	21364.5325	193	110.6971		
	SD	14.872	9.533	11.738	10.550	TOTAL	21702.0000	195			
	N	19	139	26	184	BETWEEN GROUPS	6.7276	2	3.3638	2.2154	0.0130
2	M	5.316	5.273	4.731	5.201	WITHIN GROUPS	274.8322	181	1.5184		
	SD	1.336	1.122	1.663	1.240	TOTAL	281.5598	183			
	N	21	137	26	184	BETWEEN GROUPS	1.9027	2	0.9513	0.5213	-0.0052
3	M	4.905	4.949	4.654	4.902	WITHIN GROUPS	330.3365	181	1.8251		
	SD	1.338	1.291	1.648	1.347	TOTAL	332.2391	183			
	N	21	148	27	196	BETWEEN GROUPS	7.0312	2	3.5156	0.4356	-0.0058
4	M	4.571	4.628	4.074	4.546	WITHIN GROUPS	1557.5555	193	8.0702		
	SD	2.767	2.834	2.934	2.833	TOTAL	1564.5867	195			
	N	21	137	27	185	BETWEEN GROUPS	7.7432	2	3.8716	2.6771	0.0178
5	M	6.381	6.044	5.593	6.016	WITHIN GROUPS	263.2081	182	1.4462		
	SD	0.973	1.218	1.279	1.213	TOTAL	270.9514	184			
	N	20	136	26	182	BETWEEN GROUPS	3.5724	2	1.7862	3.3347	0.0250
6	M	4.700	4.551	4.192	4.516	WITHIN GROUPS	95.8782	179	0.5356		
	SD	0.571	0.687	1.021	0.741	TOTAL	99.4505	181			
	N	20	143	24	187	BETWEEN GROUPS	358.4311	2	179.2156	5.7973	0.0488
7	M	17.250	19.231	22.708	19.465	WITHIN GROUPS	5688.0929	184	30.9135		
	SD	5.495	5.608	5.312	5.702	TOTAL	6046.5241	186			
	N	21	148	27	196	BETWEEN GROUPS	70.1301	2	35.0650	0.1379	-0.0089
8	M	86.000	87.655	88.370	87.577	WITHIN GROUPS	49067.7220	193	254.2369		
	SD	17.418	14.982	19.614	15.874	TOTAL	49137.8520	195			
	N	18	116	19	153	BETWEEN GROUPS	18.3123	2	9.1562	3.2282	0.0283
9	M	3.667	2.767	3.474	2.961	WITHIN GROUPS	425.4524	150	2.8363		
	SD	2.000	1.540	2.170	1.709	TOTAL	443.7647	152			
	N	18	123	20	161	BETWEEN GROUPS	9.0834	2	4.5417	1.8986	0.0110
10	M	3.278	2.634	3.100	2.764	WITHIN GROUPS	377.9477	158	2.3921		
	SD	1.994	1.444	1.714	1.555	TOTAL	387.0311	160			
	N	19	125	18	162	BETWEEN GROUPS	3.7528	2	1.8764	0.9950	-0.0001
11	M	3.158	2.688	2.833	2.759	WITHIN GROUPS	299.8583	159	1.8859		
	SD	1.068	1.382	1.581	1.373	TOTAL	303.6111	161			
	N	20	128	20	168	BETWEEN GROUPS	19.1507	2	9.5753	5.6027	0.0519
12	M	3.150	2.383	3.200	2.571	WITHIN GROUPS	281.9922	165	1.7090		
	SD	1.040	1.293	1.609	1.343	TOTAL	301.1429	167			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
13	N	19	81	9	109	BETWEEN GROUPS	986.5235	2	493.2617	7.6958	0.1094
	M	29.421	34.765	41.889	34.422	WITHIN GROUPS	6794.0637	106	64.0949		
	SD	7.669	8.190	6.791	8.488	TOTAL	7780.5872	108			
14	N	19	123	26	168	BETWEEN GROUPS	10917.2033	2	5458.6016	44.2909	0.3401
	M	30.000	45.520	61.231	46.196	WITHIN GROUPS	20335.3146	165	123.2443		
	SD	8.981	11.167	12.114	13.680	TOTAL	31252.5179	167			
15	N	15	122	17	154	BETWEEN GROUPS	0.5702	2	0.2851	1.1086	0.0014
	M	2.400	2.607	2.588	2.584	WITHIN GROUPS	38.8324	151	0.2572		
	SD	0.507	0.507	0.507	0.507	TOTAL	39.4026	153			
16	N	19	123	26	168	BETWEEN GROUPS	7227.7397	2	3613.8698	37.7133	0.3041
	M	41.632	53.317	66.808	54.083	WITHIN GROUPS	15811.0937	165	95.8248		
	SD	9.884	8.721	13.819	11.746	TOTAL	23038.8333	167			
17	N	13	98	14	125	BETWEEN GROUPS	1104.1688	2	552.0844	2.1278	0.0177
	M	86.077	92.316	98.857	92.400	WITHIN GROUPS	31653.8312	122	259.4576		
	SD	16.230	15.482	20.084	16.254	TOTAL	32758.0000	124			
18	N	21	148	27	196	BETWEEN GROUPS	9107.0457	2	4553.5229	51.9270	0.3420
	M	34.952	48.764	62.556	49.184	WITHIN GROUPS	16924.3420	193	87.6909		
	SD	8.840	9.075	11.188	11.554	TOTAL	26031.3878	195			
19	N	21	147	26	194	BETWEEN GROUPS	1510.5083	2	755.2542	10.9597	0.0931
	M	47.714	54.136	59.115	54.108	WITHIN GROUPS	13162.2185	191	68.9121		
	SD	8.421	8.162	8.981	8.719	TOTAL	14672.7268	193			
20	N	21	146	27	194	BETWEEN GROUPS	2112.1972	2	1056.0986	13.0661	0.1106
	M	47.810	56.075	61.111	55.881	WITHIN GROUPS	15438.0760	191	80.8276		
	SD	9.842	8.712	9.799	9.536	TOTAL	17550.2732	193			
21	N	18	132	25	175	BETWEEN GROUPS	363.2514	2	181.6257	2.7569	0.0197
	M	26.389	29.856	32.280	29.846	WITHIN GROUPS	11331.5829	172	65.8813		
	SD	8.190	8.189	7.657	8.198	TOTAL	11694.8343	174			
22	N	18	132	25	175	BETWEEN GROUPS	474.6017	2	237.3008	3.4730	0.0275
	M	26.333	29.886	33.040	29.971	WITHIN GROUPS	11752.2555	172	68.3271		
	SD	8.007	8.328	8.106	8.383	TOTAL	12226.8571	174			
23	N	18	125	22	165	BETWEEN GROUPS	461.1447	2	230.5724	3.6379	0.0310
	M	26.000	29.576	32.818	29.618	WITHIN GROUPS	10267.8007	162	63.3815		
	SD	6.979	8.203	7.222	8.088	TOTAL	10728.9455	164			
24	N	18	132	25	175	BETWEEN GROUPS	494.3455	2	247.1727	3.5320	0.0281
	M	22.500	27.947	28.360	27.446	WITHIN GROUPS	12036.8888	172	69.9819		
	SD	7.602	8.234	9.513	8.486	TOTAL	12531.2343	174			

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LLOYD 1-14:  READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO FEMALES

 J           1        2        3      TOTAL          SOURCE        SUM OF SQUARES    DF      MEAN SQUARE    F RATIO     OMEGA SQ

      N      4       64        5        73     BETWEEN GROUPS          38.3944       2         19.1972      0.2829      -0.0200
 25   M   26.500   29.141   30.600   29.096    WITHIN GROUPS         4749.9344      70         67.8562
      SD  11.818    8.039    8.050    8.155    TOTAL                 4788.3288      72

      N     18      130       24       172     BETWEEN GROUPS         391.4074       2        195.7037      3.4054       0.0272
 26   M   29.278   33.408   35.333   33.244    WITHIN GROUPS         9712.3368     169         57.4694
      SD   6.763    7.676    7.614    7.687    TOTAL                10103.7442     171

      N      1       19        9        29     BETWEEN GROUPS           7.7112       2          3.8556      0.0412      -0.0708
 27   M   35.000   32.842   32.222   32.724    WITHIN GROUPS         2434.0819      26         93.6185
      SD   0.0      9.039   10.975    9.338    TOTAL                 2441.7931      28

      N     18      130       25       173     BETWEEN GROUPS         255.1950       2        127.5975      2.1202       0.0128
 28   M   31.722   35.177   36.520   35.012    WITHIN GROUPS        10230.7819     170         60.1811
      SD   7.144    7.925    7.246    7.808    TOTAL                10485.9769     172

      N     18      130       25       173     BETWEEN GROUPS          41.1804       2         20.5902      0.3576      -0.0075
 29   M   33.333   34.946   34.800   34.757    WITHIN GROUPS         9788.6231     170         57.5801
      SD   7.731    7.421    8.337    7.560    TOTAL                 9829.8035     172

      N     17      128       24       169     BETWEEN GROUPS         436.7625       2        218.3812      2.2410       0.0145
 30   M   27.588   31.883   34.167   31.775    WITHIN GROUPS        16176.6932     166         97.4500
      SD  11.641    9.686    9.540    9.944    TOTAL                16613.4556     168

      N     18      134       23       175     BETWEEN GROUPS         561.3189       2        280.6595      3.0660       0.0231
 31   M   28.111   32.201   35.565   32.223    WITHIN GROUPS        15744.9897     172         91.5406
      SD   9.815    9.405   10.317    9.681    TOTAL                16306.3086     174

      N     17      128       22       167     BETWEEN GROUPS         766.5729       2        383.2865      4.0454       0.0352
 32   M   25.412   31.344   34.182   31.114    WITHIN GROUPS        15538.2654     164         94.7455
      SD   9.254    9.503   11.337    9.911    TOTAL                16304.8383     166

      N     14      123       16       153     BETWEEN GROUPS         523.9084       2        261.9542      2.7810       0.0228
 33   M   26.071   29.886   34.375   30.007    WITHIN GROUPS        14129.0851     150         94.1939
      SD   8.922    9.823    9.387    9.818    TOTAL                14652.9935     152

      N     11      104       14       129     BETWEEN GROUPS         338.0170       2        169.0085      2.7028       0.0257
 34   M   27.636   29.212   34.071   29.605    WITHIN GROUPS         7878.8202     126         62.5303
      SD   8.778    8.031    5.980    8.012    TOTAL                 8216.8372     128

      N      6       82       13       101     BETWEEN GROUPS          57.9942       2         28.9971      0.5979      -0.0080
 35   M   32.500   29.732   31.077   30.069    WITHIN GROUPS         4752.5206      98         48.4951
      SD   6.058    6.853    7.984    6.936    TOTAL                 4810.5149     100

      N      6       71       11        88     BETWEEN GROUPS          69.0412       2         34.5206      0.8300      -0.0039
 36   M   29.833   28.972   31.636   29.364    WITHIN GROUPS         3535.3224      85         41.5920
      SD   7.055    6.465    6.005    6.437    TOTAL                 3604.3636      87
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LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
37	N	16	126	22	164	BETWEEN GROUPS	2046.6374	2	1023.3187	8.0709	0.0794
	M	79.188	88.032	94.045	87.976	WITHIN GROUPS	20413.2651	161	126.7905		
	SD	11.635	11.316	10.639	11.738	TOTAL	22459.9024	163			
38	N	12	99	14	125	BETWEEN GROUPS	855.1423	2	427.5711	4.3652	0.0511
	M	87.750	89.788	97.643	90.472	WITHIN GROUPS	11950.0097	122	97.9509		
	SD	7.689	10.157	9.564	10.162	TOTAL	12805.1520	124			
39	N	6	71	10	87	BETWEEN GROUPS	3.9311	2	1.9656	1.1114	0.0026
	M	4.167	3.521	4.000	3.621	WITHIN GROUPS	148.5516	84	1.7685		
	SD	1.602	1.361	0.816	1.332	TOTAL	152.4828	86			
40	N	13	106	19	138	BETWEEN GROUPS	1372.3761	2	686.1880	6.2267	0.0704
	M	44.385	49.009	56.789	49.645	WITHIN GROUPS	14877.2254	135	110.2017		
	SD	7.512	10.407	12.533	10.891	TOTAL	16249.6014	137			
41	N	14	109	19	142	BETWEEN GROUPS	4297.0589	2	2148.5294	9.0054	0.1013
	M	46.143	59.982	69.211	59.852	WITHIN GROUPS	33162.8355	139	238.5816		
	SD	14.255	15.751	14.390	16.299	TOTAL	37459.8944	141			
42	N	13	95	18	126	BETWEEN GROUPS	1350.2347	2	675.1174	2.2010	0.0187
	M	42.077	50.084	55.444	50.024	WITHIN GROUPS	37728.6938	123	306.7373		
	SD	19.294	17.025	18.809	17.681	TOTAL	39078.9286	125			
43	N	13	104	19	136	BETWEEN GROUPS	283.7200	2	141.8600	1.4430	0.0065
	M	49.538	54.260	55.000	53.912	WITHIN GROUPS	13075.2212	133	98.3099		
	SD	8.452	9.870	11.015	9.948	TOTAL	13358.9412	135			
44	N	13	104	18	135	BETWEEN GROUPS	1071.9405	2	535.9702	5.0545	0.0567
	M	45.308	52.096	57.222	52.126	WITHIN GROUPS	13996.9188	132	106.0373		
	SD	9.411	10.176	11.553	10.604	TOTAL	15068.8593	134			
45	N	3	33	6	42	BETWEEN GROUPS	883.8766	2	441.9383	1.0208	0.0010
	M	54.000	67.485	75.000	67.595	WITHIN GROUPS	16884.2424	39	432.9293		
	SD	26.907	20.094	22.432	20.818	TOTAL	17768.1190	41			
46	N	3	33	6	42	BETWEEN GROUPS	422.6732	2	211.3366	0.6194	-0.0185
	M	59.333	71.303	72.667	70.643	WITHIN GROUPS	13306.9697	39	341.2044		
	SD	16.862	16.476	28.465	18.299	TOTAL	13729.6429	41			
47	N	3	33	6	42	BETWEEN GROUPS	601.5823	2	300.7911	0.9224	-0.0037
	M	56.667	69.424	73.833	69.143	WITHIN GROUPS	12717.5606	39	326.0913		
	SD	21.008	16.636	24.408	18.024	TOTAL	13319.1429	41			
48	N	14	112	16	142	BETWEEN GROUPS	57.5719	2	28.7860	2.7074	0.0235
	M	6.143	7.321	8.875	7.380	WITHIN GROUPS	1477.8929	139	10.6323		
	SD	3.939	3.214	2.941	3.300	TOTAL	1535.4648	141			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
49	N	14	114	17	145	BETWEEN GROUPS	56.5455	2	28.2727	2.1021	0.0150
	M	4.929	7.044	6.588	6.786	WITHIN GROUPS	1909.8269	142	13.4495		
	SD	2.786	3.799	3.337	3.695	TOTAL	1966.3724	144			
50	N	14	114	17	145	BETWEEN GROUPS	182.9988	2	91.4994	5.8792	0.0631
	M	8.000	9.851	12.706	10.007	WITHIN GROUPS	2209.9943	142	15.5633		
	SD	4.188	3.745	4.985	4.077	TOTAL	2392.9931	144			
51	N	14	111	17	142	BETWEEN GROUPS	53.1749	2	26.5875	2.2010	0.0166
	M	4.429	6.459	6.588	6.275	WITHIN GROUPS	1679.1138	139	12.0800		
	SD	1.910	3.474	4.360	3.505	TOTAL	1732.2887	141			
52	N	14	111	17	142	BETWEEN GROUPS	154.3279	2	77.1639	6.5335	0.0723
	M	7.714	8.396	11.471	8.697	WITHIN GROUPS	1641.6510	139	11.8104		
	SD	2.644	3.501	3.555	3.569	TOTAL	1795.9789	141			
53	N	14	111	17	142	BETWEEN GROUPS	48.0589	2	24.0294	1.4629	0.0065
	M	5.571	6.784	8.059	6.817	WITHIN GROUPS	2283.1806	139	16.4258		
	SD	3.877	3.834	5.425	4.066	TOTAL	2331.2394	141			
54	N	14	112	17	143	BETWEEN GROUPS	226.2582	2	113.1291	8.4227	0.0941
	M	4.500	6.821	9.824	6.951	WITHIN GROUPS	1880.3992	140	13.4314		
	SD	3.107	3.605	4.419	3.852	TOTAL	2106.6573	142			
55	N	14	108	17	139	BETWEEN GROUPS	99.0165	2	49.5082	4.0625	0.0422
	M	7.357	7.574	10.118	7.863	WITHIN GROUPS	1657.3864	136	12.1867		
	SD	3.342	3.531	3.333	3.568	TOTAL	1756.4029	138			
56	N	13	108	17	138	BETWEEN GROUPS	163.5513	2	81.7756	5.8179	0.0653
	M	6.846	7.861	10.941	8.145	WITHIN GROUPS	1897.5502	135	14.0559		
	SD	3.484	3.665	4.437	3.879	TOTAL	2061.1014	137			
57	N	21	148	27	196	BETWEEN GROUPS	8289.6654	2	4144.8327	248.4181	0.7163
	M	86.619	99.446	112.889	99.923	WITHIN GROUPS	3220.1866	193	16.6849		
	SD	4.153	4.180	3.434	7.683	TOTAL	11509.8520	195			